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PROCEEDINGS

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AMERICAN SOCIETY

OF

CIVIL ENGINEERS

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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

CONTENTS

	PAGE
Minutes of Meetings:	
Of the Society, November 2d, 1921	839
Of the Board of Direction, October 10th, 11th and 12th, 1921	839
Committee Appointed by Board of Direction to Report on Licensing of Professional Engineers.	869
Special Committee on Specification for Bridge Design and Construction	870
Items of Interest	872
Activities of Local Sections	881
Employment Bulletin	886
Announcements:	
Hours during which the Reading Room is open	888
Future Meetings	888
Second Meetings of the Month	888
Annual Meeting	889
Transactions for Sale	889
Searches in the Library	889
Papers and Discussions	889
Local Sections of the American Society of Civil Engineers	890
Student Chapters of the American Society of Civil Engineers	894
Privileges of Engineering Societies Extended to Members	896
New Books	897
Membership (Additions, Reinstatements, Resignations, Deaths)	902
Recent Engineering Articles of Interest	908

MINUTES OF MEETINGS

OF THE SOCIETY

November 2d, 1921.—The meeting was called to order at 8 P. M.; Elbert M. Chandler, Acting Secretary; and present, also, one member.

There being no quorum, the meeting was adjourned to November 16th, 1921.

OF THE BOARD OF DIRECTION

(Abstract)

October 10th, 1921.—The Board met at 10.05 A. M., at the Headquarters of the Society; President George S. Webster in the chair; Elbert M. Chandler, Acting Secretary; and present also Messrs. Anderson, Beahan, Brown, Cum-

mings (came in at 10.40 A. M.), Curtis, Darrow, Elwell, Greene, Grunsky, Henny, Herschel, Hogan, Hovey, Hoyt, Hudson (came in at 12.10 P. M.), Humphrey, Hunt, Langthorn, Marston (came in at 10.20 P. M.), O'Connor, Pegram (came in at 10.25 A. M.), Talbot, and Wall.

The minutes of the meetings of the Board of Direction of June 6th, July 11th, and September 12th, 1921, were approved.

The following minutes of the meetings of the Executive Committee of July 11th, and September 12th, 1921, were approved, and the actions therein described were made the actions of the Board of Direction.

MEETING OF EXECUTIVE COMMITTEE, JULY 11TH, 1921.

"The Executive Committee met at 2.25 P. M., July 11th, 1921; President George S. Webster in the chair; Elbert M. Chandler, Acting Secretary; and present also Messrs. Herschel, Hovey, and Acting Chairman Humphrey of the Publication Committee.

"The suggestion made by Vice-President Stuart at the meeting of the Board of Direction on June 6th, 1921,* which was referred to this Committee, that the Executive Committee present to the Board some broad plan by which from 100 to 250 men in the Profession can be honored by the Society in some way, was considered, and the following motion was made by Treasurer Hovey, seconded by Past-President Herschel, and carried unanimously:

"'That the Acting Secretary be authorized to communicate with Mr. Stuart and that he prepare, to present to the Executive Committee at its next meeting, his ideas in connection with this matter.'

"The Acting Secretary reported that, as authorized at the meeting of the Board of Direction of June 6th, 1921,† President Webster had appointed Messrs. McConnell, Langthorn, and Brown, a Committee to consider the Joint Committee Report on Quantity Survey and Payment for Estimating; Recommended Procedure to Owners and Investors, Architects, Engineers, and Contractors, prepared by a Joint Committee representing the American Institute of Architects, American Engineering Council of The Federated American Engineering Societies, and the Associated General Contractors of America, which report has received the approval of these organizations; that the latter organization is holding up the publication of the report pending receipt of the approval of this Society; further, that Chairman McConnell had written to President Webster, under date of June 29th, 1921,‡ stating: 'it is requested that you accept this letter as the recommendation of your Special Committee endorsing the subject matter sent out by the Joint Committee and recommending that the American Society of Civil Engineers give the Joint Report a prompt endorsement.'

"After discussion, the following motion was made by Past-President Herschel, seconded by Treasurer Hovey, and carried:

"'That this matter be referred to the full Board and that prior to the meeting copies of the report be sent to each Director.'

"The following letter of July 8th, 1921, from Herbert C. Hoover, M. Am. Soc. C. E., requesting that a member of this Society be appointed to represent

* *Proceedings*, Am. Soc. C. E., August, 1921, p. 589.

† *Proceedings*, Am. Soc. C. E., August, 1921, p. 583.

‡ Director McConnell has asked that the following be inserted: "calling attention to the unanimous endorsement of the Joint Committee Report by the members of the Special Committee.

it at the meeting of a committee to consider dates on Highway Contracts, was read by the Acting Secretary:

"'JULY 8TH, 1921.

"'E. M. CHANDLER, *Secretary,*
"'AMERICAN SOCIETY OF CIVIL ENGINEERS,
"'29 West 39th Street, New York City.

"'MY DEAR MR. CHANDLER.—I am very anxious to secure the appointment of a committee of representatives of our leading engineering societies to consider the question of shifting dates under which contracts for highway construction are let. This applies with more emphasis than usual to the present situation when we are confronted with tremendous unemployment during the next winter.'

"'If our various States would make their contracts for road building in the fall this would maintain some employment in the distribution of material during the winter; but of even more importance the States would also be able to define their requirements to the material and equipment manufacturers and thus stimulate employment in that quarter at an earlier season.'

"'The time is rather short for action in the matter and I, therefore, would like if you would take up with the Directors in the Society and ask them if they could appoint some one member to represent you on a committee that I am calling to a meeting in Washington on Monday, July 18th, 1921, at twelve o'clock.'

"'My general view is that if a committee of engineers upon examination found it an advisable policy for the States to place contracts earlier than is done I would address a letter to the Governors of these States, urging that it be done. In so doing I would expect the support and assistance of the engineering bodies of the country in seconding my efforts.'

"'Yours faithfully,

"'HERBERT HOOVER.'"

"On motion, duly seconded and carried, the President was authorized to appoint such representative, and he subsequently appointed William B. Uhler, M. Am. Soc. C. E.

"The following letter dated June 8th, 1921, from Herbert C. Hoover, M. Am. Soc. C. E., requesting that one of the members of this Society be appointed to co-operate with the Building Code Committee of the U. S. Department of Commerce, was read by the Acting Secretary:

"'JUNE 8TH, 1921.

"'AMERICAN SOCIETY OF CIVIL ENGINEERS,
"'33 West 39th Street, New York, N. Y.

"'DEAR SIRS.—I have recently appointed a committee to define some of the needless variations and disagreements in building codes, and to suggest amendments. The names of the members of the Committee and their associations are given on the sheet enclosed. [Edwin H. Brown, Architect, Minneapolis, Minn., Chairman, Committee on Small Houses, American Institute of Architects; William K. Hatt, Professor of Civil Engineering, Purdue University, Lafayette, Ind., Specialist on Structural Materials; Rudolph P. Miller, Superintendent of Buildings, New York City, Chairman, Building Officials' Conference; J. A. Newlin, in Charge of Timber Tests, U. S. Forest Products Laboratories, Madison, Wis.; Ernest J. Russell, Architect, St. Louis, Mo., well-known authority on building construction; Joseph R. Worcester, Consulting Engineer, Boston, Mass., Specialist on Structural Steel Construction; Ira H. Woolson, Chairman, Consulting Engineer, National Board of Fire Underwriters, New York City.]'

"'The interest of your organization in this general subject, and its contact with construction problems, lead me to ask if you could arrange for one of

the members of your organization to be appointed to co-operate from time to time with this Committee?'

"'At the outset it would be helpful if such a representative of your organization would gather any data upon this subject that may have been compiled by any of your committees and would forward it for the use of the Building Code Committee, care of the Department of Commerce.'

"'Regarding this work as of special importance at this time, I will be very grateful for your co-operation.'

"'Yours faithfully,

"'HERBERT HOOVER.'"

"On motion of Treasurer Hovey, seconded by Past-President Herschel, and carried, the President was authorized to appoint such member, and he subsequently appointed James H. Edwards, M. Am. Soc. C. E.

"Chairman Humphrey, of the Committee on Licensing Engineers, explained that the June Board meeting had appropriated $50 for the expenses of his Committee, and that the bill from the stenographer for reporting the hearing held on June 7th, 1921, amounts to $111.25; also, that hearings will probably be held in August, September, October, and November, at a probable average expense of $100 each; that the Committee feels this is one of the most important matters before the Society at the present time, and that it is essential that there shall be a stenographic record of everything that is said.

"The following motion was made by Past-President Herschel, seconded by Treasurer Hovey, and carried:

"'That it is the consensus of opinion of the Executive Committee that stenographic notes be taken of the meetings and that the Chairman be authorized to arrange if possible for other participants to share the expense and be furnished copies of the report, and that distribution of the report be left to the discretion of the Committee.'

"On motion of Past-President Herschel, duly seconded and carried, the payment of the bill of $111.25 of the stenographer was authorized. [It is expected that the Society will be reimbursed so that the appropriation of $50 will not be exceeded.]

"The Acting Secretary reported that W. L. Stevenson, Secretary of the Nominating Committee, under date of June 28th, 1921, had advised him of the members of the Nominating Committee in attendance at the meeting of the Committee held in New York City on June 25th, 1921, and that Mr. Stevenson had stated: 'Mr. D. H. Maury, representative of District No. 8, did not attend the meeting, but Mr. Chevalier, representative of District No. 1, informed the Committee that Mr. Maury had come to New York, had been taken ill and, at the time of the meeting, was confined in a hospital.'

"On motion of Past-President Herschel, seconded by Treasurer Hovey, and carried, mileage was allowed Mr. Maury.

"On motion, duly seconded, and carried, November 1st, 1921, was fixed as the date for closing the receipt of the Preliminary Suggestions for Members of the Nominating Committee, and 10 A. M., January 16th, 1922, as the date for closing the receipt of the Final Suggestions; and the President was authorized to appoint a committee of three resident Directors to canvass these Suggestions. [The usual dates of issue are September 15th and December 15th, respectively.]

"The Acting Secretary called attention to the resolution adopted by the Board of Direction at its meeting of April 26th, 1921,* providing for the publication in *Proceedings,* issued immediately after the nomination of the several candidates for office, a biographical sketch of each candidate, including his professional record, and to the provision of the Constitution requiring that

* *Proceedings,* Am. Soc. C. E., May, 1921, p. 460.

directly after October 1st, the list of nominees shall be mailed to the Corporate Membership; and authorization was given for the publication of these biographical sketches in the October, 1921, *Proceedings*.

"The Acting Secretary presented a letter from Chairman Talbot, of the Committee to Make Recommendations on Personnel of Committee of 7 or 9 on Research and on the Personnel of not more than 15 Representatives (to include the members of the Committee on Research) of the Society on the Advisory Committee on Civil Engineering of the Division of Engineering of the National Research Council, to President Webster, dated July 8th, 1921, asking whether the President could be authorized to appoint the Advisory Committee on Research so that the arrangements could be made during the summer.

"It was decided to let this matter go over until the October Board meeting.

"Adjourned 4.05 P. M."

Meeting of Executive Committee, September 12th, 1921.

"The Executive Committee met at 2.30 P. M., September 12th, 1921; President George S. Webster in the chair; Elbert M. Chandler, Acting Secretary; and present, also, Messrs. Herschel, Hovey, Hunt, and Stuart (came in at 3.30 P. M.)

"On motion, duly seconded, and carried, the President was authorized to appoint the necessary Tellers to canvass the ballots on the proposed Revised Constitution to be made at the October 5th, 1921, Society Meeting.

"It was reported that arrangements have been made whereby the New York Section will take charge of the second meeting of the month as was done with success last year, but that the sessions of the New York Section do not begin until October and this leaves the meeting for September 21st, 1921, unprovided for.

"The Acting Secretary suggested that as there is no specific provision in the Constitution necessitating the holding of a meeting on the third Wednesday of each month, that the Executive Committee authorize him to hold no meeting on the third Wednesday in September.

"On motion, duly seconded, and carried, the authority requested was granted.

"It was further reported that the first Wednesday in November is November 2d, 1921, but the Publication Committee would like the Board to cancel such Society meeting and have meetings on or about November 16th, 1921 [two weeks later] as it is planned to have a general conference on Problems in Sanitation, and if the date is so changed it will enable those attending the meeting of the American Public Health Association at that time also to attend the Society meeting, thereby insuring a much fuller discussion of this important subject. [November 16th, 1921, is the date of the New York Section Meeting, but the Section will let the Society have that date.]

"On motion, duly seconded, approval was given to hold the Society meeting on November 16th, 1921, and the Acting Secretary was instructed to take such steps as are necessary to comply with the Constitution relative to the Society meeting on the first Wednesday in November.

"It was reported that, in accordance with informal approval received from individual members of the Executive Committee, and by letter of July 18th, 1921, from President Webster, stating that he believed it would be proper for the Society to urge the appointment of an Engineer to succeed Judge Prouty as Director of Valuation, Interstate Commerce Commission, the Acting Secretary wrote to Chairman Clark, of the Interstate Commerce Commission, urging the appointment of some qualified professional engineer for this most important work.

"In his reply of July 21st, 1921, Chairman Clark states that the suggestion will be given full consideration, and, for the Commission, expresses appreciа-

tion of the spirit of constructive helpfulness, good-will, and co-operation in which the Acting Secretary wrote.

"The Acting Secretary reported that on hearing of the election of Prof. Henry H. Geffcott, as Secretary of the Institution of Civil Engineers, he had written Prof. Geffcott, a letter of congratulation, and presented the following reply which he had received, dated August 31st, 1921:

"'I thank you most warmly for your kind letter of congratulations and good wishes to me on my appointment to the Secretaryship of the Institution of Civil Engineers.

"'I look forward with much pleasure to my new work. I need hardly say I heartily reciprocate your wishes for cordial co-operation between our Institutions, and I trust that our work may be mutually helpful in the interests of our common profession.'"

"The following action of the Board of Direction at its meeting of August 9th, 1920,* was reported:

"'*Moved:* That the consideration of the technical activities of the Society as a whole, and also of its Sections, be made a matter of special discussion by the Board of Direction at its Fall Meeting, and that the Publication Committee be requested to prepare and send out in advance of such Meeting a general review of the subjects considered suitable for such discussion.'

"It was further reported that at the meeting of July 20th, 1921, the Publication Committee decided to suggest to the Board that this work be turned over to the recently appointed Committee on Technical Activities, thus relieving the Publication Committee of this responsibility.

"On motion, duly seconded, the Acting Secretary was instructed to notify the Chairman of the Committee on Technical Activities of the action of the Publication Committee.

"An invitation received September 6th, 1921, from the Trustees and Faculty of The Pennsylvania State College to the Society to be represented by a delegate at the inauguration of Mr. John Martin Thomas as President of The Pennsylvania State College, on October 14th, 1921, was presented.

"On motion, duly seconded, and carried, the President was authorized to appoint such a delegate.

"A letter was presented, dated July 18th, 1921, from William Spraragen, Secretary of the Committee on Welded Rail Joints, stating that the American Bureau of Welding is endeavoring to organize such a committee and had held a preliminary organization meeting on June 9th, 1921, the minutes of which have been received, and asking for the appointment of two representatives of this Society on such committee which will hold its first meeting on September 23d, 1921; and that if it is not possible to appoint official representatives one week prior to that date, Mr. Spraragen states that he trusts two temporary representatives may be appointed, who would be interested in the work.

"On motion, duly seconded, and carried, the Acting Secretary was instructed to communicate with Mr. Spraragen to the effect that no representatives, temporary or permanent, can be appointed until the full meeting of the Board of Direction, but that the Society would be glad to receive the minutes of the preliminary meeting for presentation to the Board.†

"The suggestion made by Vice-President Stuart to the meeting of the Board of Direction of June 6th, 1921, which was referred to the Executive Committee—that it present to the Board some broad plan whereby from 100 to 250 men in the Profession can be honored by the Society in some way—was considered, this Committee having asked Mr. Stuart, who was absent

* *Proceedings*, Am. Soc. C. E., September, 1920, p. 640.

† See p. 859.

at the last meeting, to prepare for presentation to the Committee his ideas in regard to the matter.*

"After full discussion of this subject, and presentation by Mr. Stuart of his ideas, it was finally concluded that Mr. Stuart should submit a written statement outlining in detail his ideas, and that the Executive Committee would report progress at the meeting of the Board on October 10th, 1921.

"The question of publishing portraits of Past-Presidents in *Transactions* was discussed, the Library Committee having recommended to the Publication Committee that such portraits be published in the volume of *Transactions* for 1921, together with a brief biography on the page facing the photograph, and that in the future each yearly volume of *Transactions* contain the portrait of the President for that year.

"The Publication Committee decided that as this involved a matter of policy, it should be referred to the Board.

"The Acting Secretary reported that he had circularized the Executive Committee, because to include such portraits in the 1921 *Transactions* required prompt authorization, but that he had not received answers sufficiently definite to permit the inclusion of such portraits in the volume of *Transactions* for 1921, which has now gone to press.

"On motion, duly seconded, and carried, this matter was referred to the Board.†

"A letter dated September 10th, 1921, was presented from Jay Turley, Assoc. M. Am. Soc. C. E., together with copy of U. S. Senate Bill No. 2194 'to encourage the development of the agricultural resources of the United States and the establishment of rural homes through Federal and State co-operation by the employment and settlement of veterans of the Great War upon the land,' which has been referred to the Committee on Irrigation and Reclamation.

"On motion, duly seconded, and carried, the President was authorized to appoint a committee of the Board to report on this subject to the October Meeting.

"The President subsequently appointed Messrs. Davis, Grunsky, and Anderson, as such Committee.

"Adjourned at 4.05 P. M."

The President appointed Messrs. Darrow and Hoyt as Tellers to canvass the Membership Ballot. The Tellers subsequently reported and the President declared the election of candidates.

Report of Finance Committee.

The Acting Secretary presented for Chairman Herschel, of the Finance Committee, the following report:

"To the Board of Direction,
American Society of Civil Engineers:

"Your Finance Committee met on June 7th, and September 12th, 1921, these being the only meetings which it has held since the June 6th, 1921, Board Meeting. In addition to certain matters of routine, consideration was had of specific questions which are outlined, as follows:

"After careful consideration of the request of the Special Committee on Bearing Value of Soils for Foundations for an additional appropriation of $3 600, which was referred to your Committe, it was:

"'*Voted:* That in the opinion of the Finance Committee this Society should not appropriate additional funds at the present time for the Special Committee to Codify Present Practice on the Bearing Value of Soils for Foundations.'

* See p. 840.

† See p. 858.

"'In view of the many useful expenditures of Society funds which can be made and the condition of the budget, we recommend that such appropriation be not now made.'

"It was unanimously agreed to ask the Board of Direction to authorize the sale of the Fifty-seventh Street property by the Finance Committee whenever an advantageous opportunity is presented, on condition that the unanimous consent of the Committee, plus the approval of the then President, be obtained.

"All of which is respectfully submitted.

"CLEMENS HERSCHEL,
"Chairman."

On motion of Director Humphrey, duly seconded, and carried, the recommendation of this report in regard to additional appropriation for the Special Committeee on Bearing Value of Soils for Foundations, was adopted.

The recommendation in regard to the sale of the Fifty-seventh Street property of the Society, which had previously been forwarded to each Director, namely, "to ask the Board of Direction to authorize the sale of the Fifty-seventh Street property by the Finance Committee whenever an advantageous opportunity is presented, on condition that the unanimous consent of the Committee, plus the approval of the then President, be obtained," was then discussed by the following (and the previous action of the Board in this matter, taken November 9th, 1920,* was recited): Messrs. Anderson, Beahan, Cummings, Curtis, Grunsky, Henny, Herschel, Hogan, Humphrey, Langthorn, Marston, Pegram, Talbot, Wall, and Webster.

Past-President Herschel moved that the recommendation of the Finance Committee be adopted.

Director Henny offered as an amendment that a minimum net price of $500 000 be fixed.

Vice-President Hunt offered the following as an amendment to the amendment:

"That the resolution as proposed by Past-President Herschel be amended, placing a minimum net price of $600 000, provided advice of counsel is to the effect that the Board has power to delegate the authority to the Committee."

This amendment was seconded by Director Humphrey.

A show of hands on Vice-President Hunt's amendment resulted in 12 "ayes" and 9 "noes".

The President announced the amendment as carried and stated that it acted as a substitute for Director Henny's amendment.

Past-President Herschel's original motion as amended was then carried by an "aye" and "no" vote.

A report of receipts and disbursements from January 1st to September 30th, 1921, together with a comparison of the same items for the preceding year, with a report of the auditors, Messrs. Lybrand, Ross Bros. and Montgomery, certifying to the correctness of the books to date, was presented to the Board by the Acting Secretary, and copies were distributed to the members present.

REPORT OF PUBLICATION COMMITTEE.

Chairman Hunt, of the Publication Committee, reported, in regard to the proposed publication in pamphlet form of rules for the formation of Local

* *Proceedings*, Am. Soc. C. E., December, 1920, p. 896.

Sections, which the Board had referred to his Committee, that the Committee had decided against such publication in view of the existence of a form letter giving the essential information.

He then presented the following report:

"To the Board of Direction
of the American Society of Civil Engineers.

"Gentlemen.—The question as to whether or not the American Society of Civil Engineers shall solicit and publish advertisements in its monthly *Proceedings* is one that has been frequently brought before the Board of Direction of the Society and its Committee on Publications.

"The subject has been discussed at several meetings of the present Committee on Publications and very marked divergences of opinions have been expressed. The Committee feels that it is futile to bring the matter before the Board again unless it can present a reliable estimate as to the probable financial result.

"To obtain the data for such an estimate will require correspondence with possible advertisers to ascertain what amount of advertising can be secured and the returns from and cost of same.

"The Committee feels that it should not do this without special authorization from the Board, and is not willing to undertake the task if the majority of the Board is opposed *a priori* to the insertion of advertising in *Proceedings*.

"The Committee requests instructions in the premises.

"Respectfully,

"Committee on Publications,
"A. M. Hunt,
Chairman."

Chairman Hunt further suggested that a notice be sent out that a business meeting will be held (November 2d, 1921), at which there will be no programme and presumably there will not be a quorum. The Acting Secretary was instructed to hold the meeting, announce no quorum, in that event, and then adjourn until November 16th, 1921.

After discussion, on motion of Director Humphrey, duly seconded and carried, the dates were fixed as November 16th and 17th, 1921.

Chairman Hunt continued with the report of the Publication Committee in regard to advertisements in *Proceedings*.

Discussion was participated in by Messrs. Brown, Cummings, Grunsky, Henny, Hoyt, Humphrey, Hunt, and Talbot, and on motion by Director Humphrey, duly seconded, the following resolution was unanimously adopted:

"That it is the sense of this meeting that the Board is not *a priori* opposed to the insertion of advertising in *Proceedings*, provided net revenue in material amount may be derived therefrom and to that end instructs the Publication Committee to make a survey of the situation for the purpose of returning an estimate of the probable income from such source and report to the Board."

Committee on Special Committees.

In the absence of Chairman Davis of the Committee on Special Committees, the Acting Secretary reported, for the information of the Board, that this Committee had under consideration:

(1).—Suggested Appointment of a Committee to Study the Surveying and Mapping Situation and to Co-operate with the U. S. Coast and Geodetic Survey in its Activities.

(2).—Electrification of Steam Railways.

(At its meeting of March 7th, 1921* the Board decided not to appoint a Committee on Electrification of Steam Railways, but the Committee on Special Committees was instructed to investigate this question and take up the matter with other Societies in order to see in what way this Society could co-operate with other Societies in this direction.)

(3).—Suggestion by L. D. Rights, M. Am. Soc. C. E., that a Committee be Appointed to Investigate and Report on Working Stresses for Structural Steel.

(4).—Suggestion that the Society have a Card Index of Data on the Experience and Qualifications of the Membership.

This suggestion was made by A. W. Buel, M. Am. Soc. C. E., and the Board at its meeting of June 6th, 1921,† referred it to the Committee on Special Committees.

In regard to this latter item, the Acting Secretary reported that two members of the Committee had approved the suggested form.

On motion of Director Humphrey, duly seconded and carried, this form was approved, and the members of the Society are to be advised that they can bring their records up to date at any time. The understanding is that this form, in duplicate, will only be forwarded to the membership every five years.

Recess was taken for luncheon at 1 P. M.

The Board reconvened at 2.30 P. M., with the same attendance as in the forenoon, except that Director O'Connor was absent, and Vice-President Stuart came in at 5.10 P. M.

Vice-President Hunt reported progress for himself and Director Elwell as representatives of the Society on the Committee on the Proposed Universal Code of Ethics.

U. S. Civil Engineers.

Concerning a letter to the Acting Secretary by Gen. Lansing H. Beach, M. Am. Soc. C. E., Chief of Engineers of the United States Army, under date of June 23d, 1921, in regard to the resolution‡ adopted by this Board, March 8th, 1921, concerning the policy of the War Department in the employment of civilian engineers in the prosecution of river, harbor, and other civil works, and urging that Congress create the office of U. S. Civil Engineer, extended discussion ensued, participated in by Messrs. Anderson, Beahan, Brown, Cummings, Elwell, Greene, Grunsky, Henny, Herschel, Hoyt, Hogan, Humphrey, Hunt, Marston, Pegram, Talbot, and Wall. Director Humphrey offered the following resolution which was duly seconded and carried unanimously:

"The Board of Direction has considered the protest of General Lansing H. Beach, Chief of Engineers, U. S. A., and can see no reason why it should reconsider its resolution of March 8th, 1921; but inasmuch as there seems to

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* *Proceedings*, Am. Soc. C. E., April, 1921, p. 378.

† *Proceedings*, Am. Soc. C. E., August, 1921, p. 586.

‡ *Proceedings*, Am. Soc. C. E., April, 1921, p. 385.

be some ambiguity as to its intent the Board would state that there was no intention to reflect either upon the Chief of Engineers, or of the office of the Chief of Engineers, but that the resolution was directed against the system governing the employment of civilian engineers engaged in river and harbor work of the Government."

On motion of Past-President Curtis, seconded by Treasurer Hovey, and carried, it was decided that the Board would adjourn at 5.30 P. M., to meet on October 11th, 1921, at 9 A. M.

Sanitary Engineers in U. S. Public Health Service.

Chairman Anderson, of the Committee appointed to report in the matter of having Sanitary Engineers in the U. S. Public Health Service commissioned on the same basis as Medical Officers, presented the following report:

"August 4th, 1921.

"To the Board of Direction
"American Society of Civil Engineers:

"Gentlemen.—Your Committee appointed to consider and report on the matter of having Sanitary Engineers in the U. S. Public Health Service commissioned on the same basis as Medical Officers, following upon investigation of the situation, beg to submit the following report.

"A bill has been introduced into Congress by Representative Sweet, H. R. No. 7541, providing for a commissioned status to Sanitary Engineers in the United States Public Health Service, and is now under consideration by the Committee on Interstate and Foreign Service.

"We are of the opinion that such provision is desirable and necessary in order that the Government may command the services of Engineers of the qualifications required to advance the Public Health Service, and as no additional appropriations or expenditure of funds are contemplated by the Act, we recommend that the Board of Direction approve and endorse the measure, and use its best influence among Congressmen to secure its speedy enactment into law.

"Respectfully submitted by

"Arthur N. Talbot
"John C. Hoyt
"George G. Anderson, *Chairman*"

On motion of Director Anderson, seconded by Director Beahan, and carried unanimously, this report was adopted, and the Acting Secretary was instructed to send a copy of it to interested parties.

Director Grunsky, of the Committee to Report on Senate Bill *re* Encouragement of Agricultural Resources of the United States, reported progress.

Visits to Local Sections.

The following motion was made by Director Humphrey, seconded by Past-President Herschel, and carried unanimously:

"*Moved:* As a matter of record that provision be made in next year's budget for the expenses of the Secretary for visiting the Local Sections of the Society."

REVISION OF THE CONSTITUTION.

The Acting Secretary reported the result of the canvass of ballots on the proposed Revised Constitution on October 5th, 1921, which Revised Constitution was announced as carried at the Society Meeting held on that evening.*

In this connection, the Acting Secretary further reported the following matters for instructions in the premises:

(1).—That no provision is made in the new Constitution for payment of dues by members outside of North America.

On motion of Past-President Herschel, seconded by Director Grunsky, the following was unanimously carried:

"*Resolved:* That the annual dues payment by members resident outside of North America shall be as follows: Corporate Members, $20, Affiliates, $15, Juniors, $10."

Director Humphrey raised the question as to whether the Board could fix the dues of members outside of North America, and the Acting Secretary reported that an amendment to the Constitution relative to this matter would be drafted later.

(2).—That Messrs. Hovey, Clark, and Hogan have been appointed a Committee to Canvass the Preliminary and Final Suggestions for Members of the Nominating Committee, but that under the new Constitution there will be no Nominating Committee.

Treasurer Hovey moved that the aforesaid Committee be discharged, and that the Preliminary Suggestions received be destroyed and nothing further done in this matter. This motion was duly seconded and carried.

(3).—That, in the new Constitution, there is no "Associate" grade, but that the same wording is used in describing the new grade of "Affiliate" as is used in the old Constitution describing the qualifications for the grade of Associate.

Past-President Herschel moved that the following motion be adopted, and that an amendment to the Constitution be drafted which will cover this point legally:

"That hereafter the Associates now in the Society, or that may be elected before the new Constitution goes into effect, shall be classified as and called 'Affiliates'."

This motion was seconded by Treasurer Hovey and unanimously carried, discussion thereon being participated in by Messrs. Curtis, Grunsky, Humphrey, Talbot, and the Acting Secretary.

It was further decided that the abbreviation "Affiliate, Am. Soc. C. E." should be used in all cases.

(4).—That the new Constitution provides that "The Board of Direction shall secure satisfactory surety for the faithful performance of the duties of the Secretary * * * ".

On motion of Past-President Herschel, seconded by Treasurer Hovey, and unanimously carried, bond for the Secretary was fixed at $5 000, with the understanding that the Society is to pay the expense of the bond.

* *Proceedings*, Am. Soc. C. E., October, 1921, p. 789.

The Acting Secretary further reported that the new Constitution contemplates an Executive Committee to perform the functions of both the present Executive Committee and the Finance Committee; and that a large number of matters will come up immediately for interpretation and ruling on the operation and amendments to the new Constitution.

On motion of Director Grunsky, seconded by Director Beahan, the following resolution was unanimously adopted:

"Resolved: That the Executive Committee to be selected by the Board from its members to serve from November 5th, 1921, until the Executive Committee for 1922 is selected, be empowered to act at once in co-operation with the Acting Secretary, with plenary power, in all matters involving the operation of the revised Constitution and proposed amendments thereto, including authority to engage counsel, and to report to the Board at its next regular meeting.

"The Executive Committee shall consist of the President as Chairman; the present Chairman of the Finance Committee as Vice-Chairman; the Chairman of the Publication Committee; Chairman of the Library Committee; and the Treasurer. The Vice-Chairman shall be empowered to countersign against the funds of the Society in lieu of the Chairman of the outgoing Finance Committee."

Attention was called to the provision in the new By-Laws requiring a minimum membership of 20 students for a Student Chapter which should be changed to 12 in accordance with previous ruling of the Board that the minimum membership of a Student Chapter should be 12.

Also, that, in the new Constitution, it is stated:

"The Board of Direction may by a two-thirds vote of those present at a meeting duly called, amend the By-Laws consistently with this Constitution, provided that a written notice of such proposed amendment shall have been given at a previous meeting of the Board of Direction, and that the Secretary shall have mailed a copy of such proposed amendment to each member of the Board at least thirty days before the meeting at which action thereon is to be taken."

The President announced that this be considered written notice of such proposed amendments to the By-Laws and matter will come up for final consideration in January.

Committees on External Relations.

It was reported that at the meeting of the Board of Direction, on November 9th, 1920, a Committee of Corporate Members was appointed to consider and make recommendations to the Board on or before January 1st, 1921, of its suggestions for determining and governing the "external relations" of this Society with other Engineering Societies.*

At the same Board meeting a committee consisting of all the Past-Presidents of the Society was appointed to review and transmit to the Board the report of the Committee of Corporate Members.

In regard to this matter, the January 17th, 1921, Board Meeting adopted the following resolution:†

* *Proceedings*, Am. Soc. C. E., December, 1920, p. 909.
† *Proceedings*, Am. Soc. C. E., February, 1921, p. 163.

"That this Board of Direction suggests to the incoming Board of Direction in the light of the two reports just received (from the Committee of Corporate Members to Consider External Relations and from the Committee of Past-Presidents appointed to review and transmit to the Board the former report) that it would be to the advantage of the Society to have the Board of Direction sit as a Committee of the whole on matters touching upon the external relations of the Society at its Quarterly Meetings, and to appoint in such centers or districts, as may appear to it desirable, Local Committees to act under the Chairmanship of the member of the Board of Direction of the district upon these matters, in order that the work of the Committee and of the Society may be properly co-ordinated without undue expense to the Society."

At the March 7th, 1921, Board Meeting action in the matter was deferred until after the Annual Convention and at the June 6th, 1921, Board Meeting the matter was again deferred until after the canvass of the ballots on the proposed revised Constitution. As this revised Constitution has now carried and as it provides for a Public Relations Committee to consist of five members, one from the Board of Direction, and one from each of the four Vice-Presidential Zones, a tentative outline of these Vice-Presidential Districts was submitted for the consideration of the Board, and the question of the appointment of such Public Relations Committee and a review of the proposed District boundaries was brought up.

After discussion by Messrs. Curtis, Grunsky, Herschel, Hoyt, Humphrey, Talbot, and Wall, Director Humphrey moved that this matter be referred to a committee of five to be appointed by the President to consider the matter of Districts and Zones and report at the January, 1922, meeting.

This motion was seconded by Vice-President Wall and carried by a show of hands, resulting in 13 "ayes" and 3 "noes".

Elections to Honorary Membership.

The President appointed Past-Presidents Talbot and Curtis as Tellers to canvass the ballots on Honorary Membership.

The Tellers subsequently reported, and the President announced that as the result of this canvass, there had been elected as Honorary Members of the Society:

Howard Adams Carson,
Luigi Luiggi,
Charles Prosper Eugene Schneider.

Adjourned at 5.30 p. m. to meet October 11th, 1921, at 9 a. m.

October 11th, 1921.—The Board reconvened at 9.15 a. m.; President Webster in the chair; Elbert M. Chandler, Acting Secretary; and present, also, Messrs. Anderson, Brown, Curtis, Darrow, Elwell, Greene, Grunsky, Henny, Herschel, Hovey, Hoyt, Hudson (came in at 11.25 a. m.), Humphrey, Hunt, O'Connor (came in at 11 a. m.) Pegram, Stuart (came in at 11.15 a. m.), Talbot, and Wall (came in at 9.50 a. m.).

TECHNICAL INTERESTS AND ACTIVITIES OF THE SOCIETY.

The Acting Secretary read the following report from the Committee to Promote the Technical Interests and Activities of the Society:

"NEW YORK, OCTOBER 3D, 1921.

"TO THE BOARD OF DIRECTION
OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS:

"SIRS.—Your 'Committee to Promote the Technical Interests and Activities of the Society' having held a meeting at the Society House in New York on October 2d, 1921, at which there were present Messrs. Chester, Holland, Ralston, Stevenson, and the Chairman, has the honor to submit this general report on the subjects referred to it.

"The Committee ventured to allow the following principle to control its deliberations:

"That the duty of such special committees should in general be limited to the presentation of a programme of action, the administration of which should be left to the regularly constituted authorities of the Society.

"Assuming that it shall have herein presented such a programme, your Committee respectfully requests that it be discharged.

"Your Committee believes that the most promising agency for promoting the technical interests and activities of the American Society of Civil Engineers will be found to be the Local Sections, and their stimulation is considered of paramount importance.

"It is recommended that the Local Sections be urged to provide for themselves a programme of technical activities involving the selection of persons to present papers and also of persons to submit prepared discussions thereof after perusal of advance copies of the papers, but without in any way limiting extemporary discussion, to the end that the best technical thought of the community may be concentrated on the subjects presented.

"It is further recommended that each Local Section create a Committee on Publication, of not less than three members, whose duty it shall be to pass on the merits of papers and discussions presented before the Section and to classify them into the following four groups:

"(*a*) Papers and discussions suitable for publication and general discussion in the *Proceedings* of the Society.

"(*b*) Papers and discussions desirable for permanent filing in the archives of the Society and for publication in abstract in the *Proceedings*; and in the event of the publication of such abstracts notice should be given that copies of the original documents will be furnished to members desiring them, at the cost of reproduction.

"(*c*) Papers and discussions of peculiar interest to another Section or other Sections, but not of such general interest as to warrant presentation in whole or in abstract in *Proceedings*, in which case the Committee should be authorized to transmit copies of the papers and discussions to such interested Section or Sections.

"(*d*) Papers and discussions of such limited interest or scope that their presentation in other Sections or in the publications of the Parent Society is unwarranted.

"It is further recommended that in the event of a paper being received by the Society which has not passed through the hands of a Local Section and which appears to be of particular interest to a Local Section or Sections, that it be forwarded to such Local Section or Sections for discussion and consideration prior to publication in the *Proceedings* of the Society, in which case the paper and its discussions shall receive the same treatment at the hands of the

Committee on Publication of such Local Sections as though originating in the Local Sections.

"It is contemplated that papers receiving the recommendation of the Committee on Publication of any Section for publication in full or in abstract in the *Proceedings* of the Society shall be transmitted by the Secretary of the Local Section with the endorsement of the Local Committee on Publication to the Secretary of the Society whence it should follow the regular course heretofore established for papers submitted to the Society.

"Your Committee quotes with its full indorsement from the unanimous report on 'Technical Activities' of the 'Committee on Development' the recommendations:

" 'That the fortnightly meetings of the Parent Society be discontinued.'

" 'That the semi-annual meetings of the Parent Society be supplemented by the addition of a spring and fall meeting, held successively in different sections of the country in co-operation with Local Sections, and that at these meetings as well as at the Annual Meeting and the Annual Convention attention be given to technical and broad economic problems, and that at the Annual Convention at least half the time should be scheduled for the serious consideration of technical matters.'

"Your Committee endorses the recently adopted policy of the Publication Committee of the Board, to develop a comprehensive outline of technical subjects of general and national scope for presentation and discussion, to be considered at the above recommended four general meetings of the Society.

"It is recommended that subjects of minor, local, and special interest be left to the initiative of Local Sections and of individual members.

"It is further recommended that the papers and discussions heretofore presented before Local Sections, which may be in condition for publication, receive the same consideration as hereinbefore recommended for papers to be hereafter so presented.

"If the condition of the Society's finances prevents the carrying out of the programme as outlined, it is recommended that the Society adopt as liberal a policy as is consistent with its finances, in the publication of the technical productions of its Local Sections.

"Your Committee believes that the greatest deterrent to the advancement of technical activities in the Local Sections is the lack of funds, and as the carrying out of the programme herein proposed will involve a considerable expenditure of both time and money on the part of the members of the Local Sections, your Committee urges that a portion of the dues of the active members in each Section which may undertake the programme herein contemplated, be allotted to the Section to provide for the expenses involved.

"In accordance with the general spirit of this report and the principle heretofore enunciated, your Committee requests to be relieved of the responsibility of supervising the work of the sub-committees, seeing that they function properly and recommending changes in the personnel thereof. It is believed that such control can be better exercised by the regularly constituted officers of the Society than by a Committee whose members are widely separated geographically and could only be brought together at infrequent intervals, and it appears to your Committee that the direct contact of the Committees of the Local Sections herein proposed, with the Executive Officer of the Society and the elimination of lost motion consequent on functioning through a general Committee on Technical Activities, will more than compensate for any advantages that might come from the latter procedure.

"Further, your Committee believes that the Committees of Local Sections herein proposed will be a more effective means of stimulating the technical activities of the Society than the District Committees contemplated in the

resolution of the Board of Direction, and the nomination of such committees, therefore, has been omitted.

"All of which is respectfully submitted,

"J. N. CHESTER,
"C. M. HOLLAND,
"J. C. RALSTON,
"W. L. STEVENSON,
"GARDNER S. WILLIAMS, *Chairman.*"

Director Humphrey moved that the report be received, which motion was seconded by Director Anderson, and unanimously carried.

The Acting Secretary reported the following motion adopted by the Board on August 9th, 1920:*

"*Moved:* That the consideration of the technical activities of the Society as a whole, and also of its Sections, be made a matter of special discussion by the Board of Direction at its Fall Meeting, and that the Publication Committee be requested to prepare and send out in advance of such Meeting a general review of the subjects considered suitable for such discussion."

The Publication Committee recently recommended this work should be turned over to the Committee on Technical Activities, and at its meeting of September 12th, 1921,† the Executive Committee instructed the Acting Secretary, and he did, notify Chairman Gardner S. Williams, of the Committee on Technical Activities, of the action of the Publication Committee.

The following reply of September 16th, 1921, from Mr. Williams was presented:

"I have yours of September 13th, 1921, calling my attention to action of the Board of Direction in regard to the work of the Committee on Technical Activities. I regret to be compelled to say that the short notice renders it impossible for the Committee to comply with the requests of the Board. I am endeavoring to get a list of nominees for the sub-committee in shape to be submitted to the Board for confirmation at the October meeting, but I do not feel that it will be possible for the Committee to do more than that at this time.

"I have a feeling, too, that there is considerably more being asked of this Committee than was contemplated at the time it was appointed, certainly much more than I understood to be expected of me as Chairman of it. If the Board of Direction wishes to discuss the subject of Technical Activities, I would as an individual and not as a member of the Committee respectfully refer them to Section A of the report of the Committee on Development, presented to the Board of Direction in October, 1919. This Section was prepared after an extended and careful consideration and very free discussion by the Committee whose membership was far more representative than that of the Committee of which I have the honor to be Chairman. That portion of the report, it will be recalled, was unanimously adopted by the Committee, and whatever differences of opinion may have existed or may now exist as to Section C, of said report, those differences should have no influence upon the standing of the other portions of the report, which were the expression of the unanimous judgment of the Committee on Development. I regret very much that my Committee will not be able to meet the wishes of the Board, but, at the same time, it seems to me that some of the matters which have been referred to us should properly be handled by the Publication Committee."

* *Proceedings*, Am. Soc. C. E., September, 1920, p. 640.

† See p. 844.

Director Humphrey moved that the report be referred back to the Committee with the request that it report at the January meeting, covering more completely the matter originally assigned to it.

Past-President Talbot offered the following motion as a substitute:

"To refer this report to a Committee of the Board with the understanding that that Committee will have a good long session before leaving New York and that this Committee be expected to make a report to the Board within 30 days so that something can be considered before the time of the January meeting."

Director Henny seconded Past-President Talbot's substitute motion, which was then carried unanimously.

The President announced that the Committee of the Board would consist of Messrs. Talbot, Chairman, Humphrey, and Hoyt.

Quantity Survey and Payment for Estimating.

"Quantity Survey and Payment for Estimating; Recommended Procedure to Owners and Investors, Architects, Engineers, and Contractors", prepared by a Joint Committee representing the American Institute of Architects, American Engineering Council of the Federated American Engineering Societies, and the Associated General Contractors of America.

This Joint Committee report was presented to the meeting of the Board of Direction of June 6th, 1921,* with the statement from R. C. Marshall, Jr., M. Am. Soc. C. E., General Manager of the Associated General Contractors of America, that his Executive Board had approved the report, as had the American Institute of Architects.

The President was authorized to appoint a committee to consider this matter, and he appointed Messrs. McConnell, Langthorn, and Brown, who reported to the meeting of the Executive Committee of July 11th, 1921,† that they approved. The Executive Committee did not act, but referred the matter to the full Board meeting.

On motion of Director Brown, seconded by Director Humphrey, and unanimously carried, the Committee's report in this matter was approved, and the Committee was discharged.

Reports from the Acting Secretary on Various Activities.

The Acting Secretary reported on the following for the information of the Board:

That the personnel of the Committee on General Form of Contract Standard Clauses was now complete, as follows: H. Eltinge Breed, Chairman; J. H. Brillhart, J. S. Langthorn, Edward H. Lee, Hunter McDonald, George H. Pegram, and Henry H. Quimby.

That the personnel of the Committee on Industrial Education was now complete, as follows: Herman Schneider, Chairman, Leonard S. Smith, and E. J. Mehren.

That acceptances of election to Honorary Membership had been received from Messrs. Samuel Rea and Ambrose Swasey.

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* *Proceedings*, Am. Soc. C. E., August, 1921, p. 583.

† See p. 840.

That President Webster would represent the Society at the inauguration of Frank Aydelotte as President of Swarthmore College on October 22d, 1921.

Change in Personnel of Special Committee on Bridge Design and Construction.

A letter dated October 8th, 1921, was presented from Chairman Henry B. Seaman, of the Special Committee to Consider and Recommend for Adoption a Specification for Bridge Design and Construction, announcing the resignation of Mr. John E. Greiner as a member of that Committee; that the Committee regretted its loss of Mr. Greiner as a most capable and efficient member in its work; and that at the meeting of the Committee on October 7th, 1921, it was unanimously agreed that Past-President George H. Pegram be recommended for appointment by this Board as a member of such Committee.

On motion of Director Humphrey, seconded by Treasurer Hovey, and unanimously carried, Past-President George H. Pegram was appointed a member of the Special Committee to Consider and Recommend for Adoption a Specification for Bridge Design and Construction.

Highway Research.

The following resolution of the American Institute of Consulting Engineers in regard to Highway Research, which had been referred by the meeting of the Board of June 6th, 1921, to Director Marston for report,* was considered:

"Resolved: That the Federal Congress be requested and strongly urged to authorize and direct the Secretary of Agriculture to set aside an appropriation, out of any unexpended balance from the sums appropriated by Congress under the Federal Aid Road Act of 1916 and the amendments thereto, a sum not to exceed three hundred thousand dollars, to be expended in research to supply the physical and economic data needed for the intelligent and efficient design, construction, maintenance, and operation of highways; said research to be conducted under the authority and control of the Engineering Division of the National Research Council, by a commission, appointed by the said Engineering Division, of three men, who shall devote their whole time to the work, and shall receive adequate compensation for their services."

Past-President Talbot subsequently offered the following resolution in this connection, which was seconded by Director Grunsky, and unanimously carried:

"Resolved: That the Board of Direction of the American Society of Civil Engineers urge upon the Congress of the United States that an appropriation of an adequate sum of money be made to be expended under the direction of the Secretary of Agriculture for research and experimental work to supply the physical and economic data needed for the intelligent and efficient design, construction, maintenance, and operation of highways and that authority be given to take advantage of existing agencies in carrying on this work."

Resolution of Appreciation for Courtesies Extended to the Delegation of American Engineers to England and France.

A dinner was given on the evening of October 10th, 1921, to the American engineers who constituted the delegation from the Founder Societies to the

* *Proceedings*, Am. Soc. C. E., August, 1921, p. 583.

English and French Societies,* and the suggestion has been made that resolutions of appreciation should be adopted for the courtesies extended to that delegation.

Report of the Nominating Committee.

The Acting Secretary presented the report of the Nominating Committee received July 5th, 1921, giving a list of nominees† selected for the offices to be filled at the 1922 Annual Meeting, and reported that, in accordance with the Constitution, he had communicated with each nominee and had received acceptances from each of them.

It was also reported that biographies of the nominees would be published in the October *Proceedings,* in accordance with previous Board action.‡

Portraits of Past-Presidents.

The question of publishing portraits of Past-Presidents, on motion of Director Hoyt, duly seconded, and carried, was referred to the Publication Committee with power to act.

Rules for Award of Arthur M. Wellington Prize.

On motion of Director Humphrey, seconded by Director Grunsky, and carried, the establishment of rules, etc., for the award of the Arthur M. Wellington Prize was referred to the Executive Committee with power and instructions to confer with the donor.

Conference on Railroad Tie Specifications.

A letter was presented from Secretary Agnew, of the American Engineering Standards Committee, dated October 7th, 1921, inviting the Society to send representatives to the Conference on Railroad Tie Specifications to be held on October 25th, 1921, in Washington, D. C.

After discussion by Past-President Talbot and Director Humphrey, the latter moved that Edwin F. Wendt and Edward M. Durham, Jr., Members, Am. Soc. C. E., be appointed as the representatives of this Society to attend this Conference and report back to the Board. This motion was duly seconded and carried.

National Board of Jurisdictional Award.

A letter was presented from R. C. Marshall, M. Am. Soc. C. E., General Manager of the Associated General Contractors of America, dated August 30th, 1921, calling attention to its resolution, *re* the actions of the Brotherhood of Carpenters with respect to the award of the National Board for Jurisdictional Awards in the Building Industry regarding hollow metal doors and trim and hollow metal window frames and sash, and asking that this matter be given as much consideration as possible to the end that the co-operative action of the several bodies may be such as to preclude the possibility of the decisions of the National Board for Jurisdictional Awards not prevailing.

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* See p. 878.

† *Proceedings,* Am. Soc. C. E., October, 1921, p. 808.

‡ *Proceedings,* Am. Soc. C. E., October, 1921, p. 791.

On motion of Past-President Talbot, seconded, and carried, this matter was ordered received and filed.

Proposed Committee on Welded Rail Joints.

An invitation received in July, 1921, to appoint two representatives of the Society on a proposed Committee on Welded Rail Joints was presented from Mr. William Spraragen who states that the American Bureau of Welding is endeavoring to organize such a committee, of which he is Secretary. The Executive Committee considered this matter at its meeting of September 16th, 1921, but decided that it was a matter for the Board to act on.

On motion of Vice-President Cummings, duly seconded, and carried, this matter was referred to L. H. Davis, M. Am. Soc. C. E., the Society's representative on the Board of Directors of the American Welding Society.

Explorative Expedition of Engineering and Scientific Research.

A letter from F. W. Lee, Assoc. M. Am. Soc. C. E., dated August 9th, 1921, was presented, suggesting that an explorative expedition of engineering and scientific research be sent out.

On motion of Director Humphrey, duly seconded and carried, it was decided that it would be inexpedient for the Board to take any action in this matter.

Certificates for Honorary Members.

The Acting Secretary called attention to the fact that when the Board elects an Honorary Member, he is simply informed by letter, and that he would recommend that the Board adopt the policy of granting an Honorary Membership attended by some fitting ceremony. It is suggested that a formal certificate be presented personally by the President at the Annual Meeting to all persons elected during the preceding year.

Director Humphrey remarked that this matter would be discussed in considering the Report of the Committee on Annual Meeting, and suggested that discussion be deferred until that time.*

Constitutions of Local Sections Approved.

The Acting Secretary reported that Constitutions have been received from the proposed Sacramento Section and the North Eastern Section of the Society, which conform in all essentials to the requirements.

On motion of Director Humphrey, duly seconded, and carried, the Constitutions of North Eastern Section and the Sacramento Section were approved, and authorization was granted for the formation of such Sections.

The Acting Secretary reported that the Constitution of the New York Section had been amended by letter ballot canvassed on September 12th, 1921, the amendments being read in full.

On motion of Director Humphrey, seconded by Treasurer Hovey, and duly carried, these amendments were approved.

* See p. 868.

The Acting Secretary reported that the Seattle Section had requested that an application form be forwarded to each member of the Section.

Discussion on the desirability of sending out application forms was participated in by Past-President Talbot, Vice-President Cummings, and Directors Anderson, Grunsky, Henny, Hoyt, and Humphrey.

On motion of Director Henny, seconded by Director Hoyt, and duly carried, the Acting Secretary was instructed to forward six application forms to each Local Section and Student Chapter and state that the Board deems it desirable that they keep application forms on hand.

International Engineering Congress, 1915.

The Acting Secretary reported for the information of the Board that the affairs of the International Engineering Congress of 1915, are now terminated. A letter of September 1st, 1921, from W. F. Durand, Chairman of the Committee, represents the final closure of all matters relating to the Congress, and encloses a financial statement of account showing a balance of $16.91, which amount Dr. Durand (in accordance with the action of the supporting Societies) forwarded to the Engineering Societies Library, together with the residual material comprising 180 volumes of the *Transactions* of the Congress and six boxes of separate papers.

On motion of Director Humphrey, duly seconded and carried, this action was approved.

Possibility of Establishment of a Paid Employment Bureau by Federated American Engineering Societies.

The Acting Secretary reported, for the information of the Board, the results of circular letter written in August, 1921, to 760 members in an effort to secure engagements for unemployed members of the Society.

In this connection a letter, dated October 10th, 1921, was reported from Secretary Wallace, of the Federated American Engineering Societies, transmitting the following resolutions adopted September 30th, 1921;

"*Whereas,* The need is pressing for a unified employment service for engineers, National in scope, local in application, and financed for adequate service; and

"*Whereas,* The contributions which the constituent societies of the Federated American Engineering Societies are able to make to the Employment Bureau have been found inadequate to provide an Employment Service such as engineers require; therefore, be it

"*Resolved:* That the Executive Board of the American Engineering Council endorses in principle a paid employment service, but with reduced fees to members of organizations supporting said service; and be it further

"*Resolved:* That a Committee of five members of the Executive Board be appointed by the Chairman and that the Boards of Direction of the four Founder Societies be requested each to appoint a member of its Board in order to form a Joint Committee of nine members on Engineering Employment with power to organize an Employment Bureau, on a plan which will invite the co-operation of interested organizations."

President Webster explained this matter. It was discussed by Directors Hoyt and Humphrey, and, on motion of the former, seconded by the latter, and duly carried, the invitation was accepted and the President was empowered to appoint a representative to consider this question with the representatives from the other Societies.

1922 Annual Convention.

At the request of the President, the Acting Secretary presented an invitation from the Convention Bureau of the Springfield, Mass., Chamber of Commerce, to hold the next Convention of the Society at that place.

On motion of Director Humphrey, duly seconded, and carried, this invitation was referred to Past-President Curtis and Director Elwell as the representatives on the Board from District No. 2, for report at the next meeting, as under the sequence adopted for Annual Conventions, the 1922 Convention will be held in that District.

New Student Chapters.

Approval was given to the formation of the following Student Chapters (at such time as the initial dues shall have been paid):

The Bucknell University Student Chapter,
The University of North Carolina Student Chapter,
The West Virginia University Student Chapter.

Annual Report of the Board of Direction.

On motion of Past-President Talbot, duly seconded, and carried, the Chairmen of the Standing Committees of the Board of Direction were appointed as a Committee to prepare the Annual Report of the Board for 1921.

John Fritz Medal Board of Award.

On motion of Past-President Curtis, seconded by Vice-President Wall, and duly carried, President Webster was appointed as one of the Society's representatives, for a four-year term, on the John Fritz Medal Board of Award, to take the place which will be made vacant by the expiration of the term of Past-President George H. Pegram in January, 1922.

Authority was also granted to pay the Society's share of the bill (amounting to $57.14) in connection with awards of the John Fritz Medal abroad for 1921 and 1922.

United Engineering Society.

On motion of Vice-President Cummings, seconded by Director Brown, and duly carried, President Webster was appointed as one of the Society's representatives, for a three-year term, on United Engineering Society to take the place which will be made vacant by the expiration of the term of J. V. Davies, M. Am. Soc. C. E., in January, 1922.

Report of the Library Committee.

The Acting Secretary presented for Chairman Stuart, of the Library Committee, the following report:

"October 10, 1921.

"To the Board of Direction,
American Society of Civil Engineers:

"Your Committee has held three meetings since the June Board meeting, on June 8th, June 27th, and August 5th, 1921, respectively.

"Besides the consideration of requests for exchange and other routine business, the following actions of note were taken:

"Action was taken in regard to the necessity for reducing the stock of publications, which matter was referred to your Committee with power to act. The recommendations made by the Acting Secretary in this matter were approved.

"On the advice of the Publication Committee that it considered that a question of policy was involved which the Board should settle in the recommendation of your Library Committee that engravings of Past-Presidents be published in *Transactions,* accompanied by a brief biography, and that in the future the annual volume of *Transactions* contain the portrait of the President of the Society for that year; the matter was presented to the Executive Committee, but no action was taken, and your Committee now presents the matter to you so that if authorized these portraits may be included in the 1922 *Transactions.*

"The matter of furnishing the outer hall was considered, and it was decided to recommend to the Board of Direction that an appropriation not to exceed $2 000 be made to purchase a rug (7 by 18 ft.), a divan, two smoking tables, and hangings for the doorways.

"All of which is respectfully submitted.

(Signed) "Francis Lee Stuart,
"Chairman."

Rearrangement of Fifteenth Floor of this Building.

The Acting Secretary explained that the architect who originally executed the plans for the Fifteenth Floor of this Building, had worked out a proposed rearrangement along the lines suggested by Vice-President Cummings, former Chairman of the Library Committee, and stated that the cost would be approximately $3 000, aside from furnishings. This plan was explained in further detail by Vice-President Cummings.

Discussion was participated in by Past-President Herschel, Vice-President Stuart, and Director Humphrey, and on motion of the latter, duly seconded, and carried, the President was authorized to appoint a special committee to report to the Board on the question of rearrangement of the Fifteenth Floor of this Building.

Advisory Committee on Civil Engineering.

Chairman Talbot, of the Committee to make recommendations on personnel of a Committee of Seven or Nine on Research and on Personnel of not more than Fifteen Representatives (to include the Committee on Research) of the Society on the Advisory Committee on Civil Engineering of the Division of Engineering of the National Research Council, reported for his Committee, and

after discussion by Messrs. Cummings, Grunsky, Hoyt, Humphrey, and Talbot, the personnel was fixed as follows, with the understanding that the Committee will appoint its own Chairman:

Research Committee.—Robert A. Cummings, W. C. Cushing, A. T. Goldbeck, D. C. Henny, R. E. Horton, Anson Marston, F. E. Schmitt, A. N. Talbot, F. E. Turneaure.

Representatives of the Society on Advisory Committee on Civil Engineering of the Division of Engineering of the National Research Council (To Include the Committee on Research).—D. A. Abrams, S. A. Greeley, W. K. Hatt, E. T. Howson, C. G. E. Larsson, W. A. Slater, C. L. Warwick.

Licensing of Engineers.

Chairman Humphrey, of the Committee on Licensing Engineers, reported as follows:

"October 10th, 1921.

"To the Board of Direction:

"Your Committee on Licensing Engineers has held Conferences on June 7th, July 11th, August 22d, and September 12th, and will hold a Conference on October 11th, 1921. At the Conferences already held, the Committee deemed it desirable to limit the attendance to those who had had experience in or made a study of licensing or registration and who could offer constructive suggestions in the matter of the registration or licensing of engineers. It was felt that better results could be secured through small representative Conferences rather than through larger meetings.

"The Committee has received criticisms of this method of procedure and has, therefore, decided to hold the Conference on October 11th, 1921, open to all those interested; it deems it to be impractical to hold Conferences in other localities.

"In the September *Proceedings,* the Committee made announcement of the Conference on October 11th, 1921, and stated that written communications will be welcomed from any one.

"The Local Sections have been invited to express their views in the matter.

"The Committee believes that, in order to make a comprehensive report on a plan of procedure for the Society, a conference with representatives of the Federated American Engineering Societies, of the American Institute of Architects, and the American Association of Engineers may be advantageous, and hereby requests permission to call such a conference if the Committee deems it desirable. It is the intention of your Committee to present its report at the January meeting of the Board of Direction.

"Respectfully submitted,

"Baxter L. Brown,
"A. M. Hunt,
"Anson Marston,
"W. Beahan,
"Richard L. Humphrey, *Chairman.*"

On motion of Director Humphrey, seconded by Director Grunsky, and duly carried, this report was accepted and the request granted.

On motion of Director Humphrey, duly seconded, and carried, authority to have stenographic reports of the two proposed Conferences on Licensing of Engineers, at a cost not to exceed $200, was granted.

The following letter from T. L. Condron, M. Am. Soc. C. E., was read:

"AUGUST 11TH, 1921.

"BOARD OF DIRECTION,
"AMERICAN SOCIETY OF CIVIL ENGINEERS,
"33 West Thirty-ninth Street, New York, N. Y.

"GENTLEMEN.—On July 11th, I attended the meeting of your Committee on Licensing at the invitation of Mr. Humphrey, Chairman. I attended this meeting as Chairman of the Committee on Licensing of Engineers of the American Engineering Council. This latter committee, as you know, consists of some fifteen or sixteen members distributed over thirteen different States in the union, nine of the members of this committee being members of the American Society of Civil Engineers. This committee was originally created by Engineering Council, of which the American Society of Civil Engineers was a constituent part.

"As the American Society of Civil Engineers is not a member of American Engineering Council, it might be questioned whether these nine members of the American Society of Civil Engineers should continue as members of a committee of that Council. I believe I am right in saying that these nine men consented to continue on this Committee, believing that thereby they would best serve the interests of their fellow members among the Civils. I would respectfully suggest to your Board, as I have also suggested to the American Engineering Council, the desirability of making this committee a joint committee of the American Society of Civil Engineers and the American Engineering Council, and I trust that this suggestion will be favorably received by both bodies. It is quite immaterial as to whether the personnel of this committee is continued or changed, but I feel that the subject of licensing or registration of engineers, perhaps has a greater bearing and significance to the members of the American Society of Civil Engineers than to members of the other National Societies.

"There certainly should be no confusion or working at cross purposes on this subject by committees of engineers, nor should there be an idea abroad that the American Engineering Council committee does not represent the interests of the American Society of Civil Engineers, so long as nine members of that committee are members of that Society.

"Yours respectfully,

"T. L. CONDRON."

Director Humphrey discussed this matter, and on motion of Director Anderson, duly seconded and carried, it was referred to the Committee on Licensing Engineers.

COMMITTEE TO FORMULATE A PLAN FOR ACTING ON APPLICATIONS.

Chairman Wall, of the Committee to Formulate a Plan for Acting on Applications for Membership, reported progress.

In the matter of a letter of April 26th, 1921, from David J. Shaw, Assoc. M. Am. Soc. C. E., *re* an official interpretation of the clause of the Constitution descriptive of "Associate", which was referred to the Committee on Applications, the following report was read:

"OCTOBER 10TH, 1921.

"BOARD OF DIRECTION,
"AMERICAN SOCIETY C. E., New York.

"GENTLEMEN.—Your Committee to Formulate a Plan for Acting on Applications for Membership, to whom was referred the letter of Mr. David J.

Shaw, Associate Member of the Society, asking for an interpretation of the meaning of the constitutional requirements for the grade of Associate, beg to submit the following comments on Mr. Shaw's letter:

"The Constitution requires that a person to be eligible for membership in the Society as an Associate must have attained a position in his special pursuit qualifying him to co-operate with engineers in the advancement of professional knowledge and practice, and has reached that position by scientific acquirements or practical experience (the last being obviously confined to experience in fields closely allied to Engineering, such as general construction, experimental research, manufacture and sale of engineering materials and machinery, etc.).

"Evidently the 'special pursuit' referred to, while not engineering, should be akin to it, for example, the vocations of superintendent, contractor, inventor, physicist, chemist, astronomer, mathematician, manufacturer, and erector of machinery, and other similar avocations or occupations.

"Mr. Shaw in saying that a literal interpretation of the language of the Constitution seems to include any and all business men who have anything whatsoever to do with work, in which engineers are interested, has overlooked the qualifying clause confining the co-operation with engineers to the advancement of professional knowledge and practice. Professional knowledge and practice are essentially different things from financing engineering work or obtaining necessary legislation for engineering projects; they refer to information about engineering materials and their proper and possible use, as well as to the methods and machinery of design and construction, which is entirely foreign to the 'co-operation' of business men in promoting a proposition.

"A banker may have attained a position in his special pursuit where he is able to forward or to kill an engineering project, whose execution requires the exercise of great skill and judgment, but it cannot be said that he attained that position by scientific acquirements or practical experience in any way related to Engineering.

"The Committee sees no ambiguity or double meaning in the language of the Constitution where the grade of Associate is defined, if it be borne in mind that the application of the phrases 'scientific acquirements', 'practical experience' and 'special pursuit' should be kept within the limits of engineering and its allied professions and businesses. * * *

"Respectfully submitted.

"JOHN C. HOYT,
"EDWARD E. WALL,
"Committee."

On motion of Past-President Wall, duly seconded, and carried, a copy of this report was ordered to be forwarded to Mr. Shaw in answer to his inquiry as to interpretation of the Constitutional requirement for the grade of Associate.

Recess was taken for luncheon at 1.10 P. M.

The Board reconvened at 2.35 P. M., with the same attendance as in the forenoon.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

On motion of Past-President Talbot, duly seconded and carried, the President was authorized to appoint two new representatives of the Society

on the American Association for the Advancement of Science to attend its meeting in Toronto, Ont., Canada, December 27th-31st, 1921.

President Webster subsequently appointed as such representatives, Messrs. R. O. Wynne-Roberts and H. E. Riggs.

Date of Next Board Meeting.

The time of the next Quarterly Board Meeting was fixed as 10 A. M., January 16th, 1922. (An Intermediate Meeting is also to be held at 10 A. M., November 21st, 1921.)

Plan of Putting Government Bureaus Under Smithsonian Institution.

A circular letter was presented from Mr. Arthur MacDonald, dated September 28th, 1921, asking the adoption of a resolution favoring the general plan of putting the scientific bureaus of the Government under the jurisdiction of the Smithsonian Institution.

The matter was discussed by Past-Presidents Curtis and Talbot and Directors Hoyt and Humphrey, and the following motion, made by Director Humphrey, was duly seconded and carried:

"That the Board deems it inexpedient to take the action requested."

Highway Contracts.

A letter was reported as having been received from W. D. Uhler, M. Am. Soc. C. E., dated September 2d, 1921, enclosing report, *re* his appointment by President Webster as a representative of the Society at the Conference called by Herbert C. Hoover, M. Am. Soc. C. E., in July, 1921, in Washington, D. C., to consider the matter of letting highway contracts during the fall months, as follows:

"September 2, 1921.

"Mr. Elbert M. Chandler, *Acting Secretary,*
"American Society of Civil Engineers,
"33 West 39th Street, New York, N. Y.

"Dear Sir.—In accordance with your letter of July 12th, advising me of my appointment as a representative of the American Society of Civil Engineers to attend a meeting with Mr. Herbert Hoover, Secretary of Commerce, on Monday, July 18th, to consider the matter of letting highway contracts during the fall months, would advise that, complying therewith, I attended the meeting in question. There were also at this meeting representatives of the American Society of Mechanical Engineers, Associated General Contractors, American Association of State Highway Officials, Bureau of Public Roads, and the Federated Engineering Societies. I am attaching a copy of recommendations* made to Secretary Hoover who, in turn, has communicated with the various Governors throughout the United States calling their attention to the advisability of fall lettings.

"Very truly yours,
"W. D. Uhler."

* See p. 873.

1922 ANNUAL MEETING.

Chairman Humphrey, of the Committee on the 1922 Annual Meeting, presented the following report:

"OCTOBER 11TH, 1921.

"TO THE BOARD OF DIRECTION:

"Your Committee on Annual Meeting submits for your approval the following proposed programme for the 1922 Annual Meeting of the Society:

"SIXTY-NINTH ANNUAL MEETING,
JANUARY 18TH-21ST, 1922.

"Wednesday, January 18th:

"10 A. M.—Business Meeting:
Annual reports will be presented.
Officers for the coming year will be elected and installed.
Reports of Special Committees will be presented.
Honorary Membership will be conferred, with formal appropriate ceremonies.

"1 P. M.—Luncheon.

"2.30 P. M.—Excursions to engineering work, motion picture studios, etc.

"9 P. M.—President's Reception.

"CONFERENCE ON NATIONAL TRANSPORTATION PROBLEMS.

"Thursday, January 19th:

"9 A. M.—Water Transportation

"2 P. M.—Railroad Transportation

"7.30 P. M.—Railroad Transportation

"9 P. M.—Smoker.

"Friday, January 20th:

"9 A. M.—Highway Transportation

"2 P. M.—Highway Transportation

"7.30 P. M.—Highway Transportation

"EXCURSIONS.

"Excursions will be arranged to points of interest in New York City for Thursday morning and Thursday afternoon for those who are not interested in the technical programme. It has been suggested that a joint luncheon be arranged for those who participate in the technical programme and those who go on the morning excursion. This will be left to the Committee on Arrangements.

"ENTERTAINMENT FOR LADIES.

"Thursday Afternoon.—A bus ride on Fifth Avenue.

"Friday Morning.—A trip through the shops.

"The Committee on Development recommended that 'at the Annual Meeting and the Annual Convention attention be given to technical and broad economic problems' and 'that the Annual Meeting be devoted to the consideration of:

"'(*a*) The printed annual reports of officers and standing committees, presented in abstract, unless otherwise ordered by vote of the meeting.'

"'(*b*) The election and installation of officers.'

"'(*c*) The presentation and discussion of reports of technical and special committees.'

"'(*d*) Other matters pertaining to the affairs of the Society and the profession on which action by the Society is desired.'

"'(*e*) A carefully planned programme of addresses on and discussions of professional or social problems of National importance.'

"'That proper provision be made for sociability, but that this should not be permitted to interfere with the consideration of the more important duties of the Society.'

"The above recommendations were approved by the Annual Meeting of 1920 and by vote of the Society canvassed April 14th, 1920.

"The Committee recommends that the policy for the Annual Meeting be similar to that for the Annual Convention; namely, that this Committee be the Committee of the Board of Direction in charge of the Annual Meeting and that a Committee on Arrangements be appointed to care for such local matters as the President's Reception, the Smoker, and the Excursion; that the technical programme be under the auspices of the Publication Committee.

"Respectfully submitted,

"(Signed) RICHARD L. HUMPHREY,
"Chairman."

Past-President Talbot spoke and Director Brown moved that the report be received and its recommendations adopted. This motion was seconded by Vice-President Wall and carried.

Director Humphrey moved that the Local Committee of Arrangements for the Annual Meeting be appointed by the President in consultation with the Committee of the Board. This motion was seconded by Past-President Pegram and carried.

Director Anderson addressed the Board regarding the desirability of creating in some way a Benevolent Fund of the Society, and offered the following motion:

"That a Committee of three be appointed to investigate and report at the next meeting."

This motion was seconded by Director Humphrey and carried.

Recessed at 6.40 P. M., to meet as a Membership Committee.

October 12th, 1921.—The Board reconvened at 10.25 A. M., at the conclusion of the meeting of the Membership Committee; Director Richard L. Humphrey in the chair; Elbert M. Chandler, Acting Secretary; and present, also, Messrs. Brown, Curtis, Hovey, Hoyt, and Talbot.

The report of the Membership Committee was presented.

On motion, duly seconded and carried, the recommendations of this report, which were not read, were adopted as the action of the Board.

CERTIFICATES FOR HONORARY MEMBERS.

Upon motion duly seconded, and carried, the plan of presenting certificates of Honorary Membership by the President at the Annual Meeting was approved, and the Acting Secretary was instructed to prepare such certificates.

Adjourned at 10.30 A. M., to meet at 10 A. M., on November 21st, 1921, at the Headquarters of the Society.

COMMITTEE APPOINTED BY THE BOARD OF DIRECTION TO REPORT ON LICENSING OF PROFESSIONAL ENGINEERS

The Fourth Conference under the auspices of the Committee on Licensing Engineers was held in the Board Room of the Society, on September 12th, 1921, at 7.30 P. M.

There was a general discussion of License and Registration Laws for Professional Engineers and Land Surveyors and a consideration of what should be the attitude of the Engineering Societies in the matter.

The following were in attendance at the Conference:

Members of the Committee.

Richard L. Humphrey, Chairman, Philadelphia, Pa.; Willard Beahan, Cleveland, Ohio; Baxter L. Brown, St. Louis, Mo.; and A. M. Hunt, New York City.

Officers of the Society.

Otis E. Hovey, Treasurer, New York City, and Elbert M. Chandler, Acting Secretary, New York City.

Others Present.

L. P. Alford, Editor, *Management Engineering,* New York City; C. E. Beam, Assoc. M. Am. Soc. C. E., Assistant to the Acting Secretary, American Society of Civil Engineers, New York City; J. A. Bensel, Past-President, Am. Soc. C. E., Consulting Engineer, New York City; Francis Blossom, M. Am. Soc. C. E., Member of Sanderson and Porter, Engineers, New York City; James H. Edwards, M. Am. Soc. C. E., Assistant Chief Engineer, American Bridge Company, New York City; Walter G. Eliot, Member, New York State Board of Licensing for Professional Engineers and Land Surveyors, New York City; D. L. Galusha, Electrical Engineer, Dwight P. Robinson and Company, Incorporated, New York City; John M. Goodell, Assoc. Am. Soc. C. E., Upper Montclair, N. J.; J. P. Hallihan, M. Am. Soc. C. E., Consulting Engineer, New York City; Peter Junkersfeld, M. Am. Soc. C. E., Engineering Manager, Stone and Webster, Boston, Mass.; Charles W. Leavitt, M. Am. Soc. C. E., Civil and Landscape Engineer, New York City; Henry G. Reist, Secretary, New York State Board of Licensing for Professional Engineers and Land Surveyors, General Electric Company, Schenectady, N. Y.; Calvin W. Rice, Secretary, American Society of Mechanical Engineers, New York City; William H. Rose, Assoc. M. Am. Soc. C. E., District Manager, Lockwood, Greene and Company, Engineers and Architects, New York City; F. T. Rubidge, Vice-President and General Manager, St. Lawrence Pyrites Company, New York City; E. N. Sanderson, Senior Member, Sanderson and Porter, Engineers, New York City; F. J. Sprague, M. Am. Soc. C. E., President, Sprague Safety Control and Signal Corporation, New York City; E. M. Van Norden, M. Am. Soc. C. E., Civil Engineer, New York Edison Company, New York City; J. G. White, M. Am. Soc. C. E., President, J. G. White and Company, Incorporated, New York City; W. J. Wilgus, M. Am. Soc. C. E., former Chairman, New York

State Board of Licensing for Professional Engineers and Land Surveyors, Consulting Engineer, New York City; W. B. Yereance, M. Am. Soc. C. E., General Manager and Chief Engineer, Eighth Avenue Railroad, Ninth Avenue Railroad, New York City.

MINUTES OF MEETINGS OF SPECIAL COMMITTEE ON SPECIFICATION FOR BRIDGE DESIGN AND CONSTRUCTION

September 16th, 1921.—The meeting was called to order at the Headquarters of the Society. Present, Henry B. Seaman, Chairman, J. R. Worcester, B. R. Leffler, M. S. Ketchum, C. W. Hudson and Howard C. Baird (Secretary).

The meeting was opened with a discussion on the advisability of preparing a Specification for Steel Railway Bridges for presentation to the Annual Meeting of the Society. After a general discussion of the subject it was agreed, on motion, duly seconded, that the Committee adhere to its intention of preparing a Railway Bridge Specification first, followed by action on the material formulated at the September meeting.

The subject of the Impact Formula to be adopted was discussed at some length, Professor Turneaure's views on the subject, prepared by Professor Hudson at the request of the Committee, being before the meeting. In view of the opinion expressed in Professor Turneaure's communication, the Secretary was instructed, on motion, duly seconded, to send to him a copy of the minutes of this meeting, inviting him to offer a modification of the formula of the American Railway Engineering Association for consideration at the next meeting of the Committee.

A general discussion on Allowed Unit Stress for Axial Compression resulted in a decision to place three-column formulas in the Specification with an explanatory note stating in effect that no agreement to endorse any one formula could be reached, all three being considered to be acceptable by the Committee as conforming to good practice.

After a general discussion of the subjects, action was taken on Weights of Material, Loads, and Unit Stresses (other than Axial Compression).

September 17th, 1921.—The meeting was called to order at the Headquarters of the Society with the same attendance as at the previous meeting.

This session was devoted to consideration of Lateral, Longitudinal, and Centrifugal Forces, and part of the subject covering Details of Design.

The matter of Bracing between Compression Chords was referred to Professor Hudson for further investigation and report, as the tentative clause covering this requirement did not meet with approval, and agreement on modifications thereon could not be reached.

Agreement was reached on clauses covering Centrifugal Force, Tractive Force, and Allowable Unit Stresses (other than Axial Compression). On motion, duly seconded, the Committee adopted without discussion Professor Hudson's report on Web Stresses in Girders prepared in accordance with the request of the Committee at the September meeting.

On motion, duly seconded, Unit Stresses for Cast Iron were eliminated as the majority of the Committee disapproved its use in bridge structures, except in special cases.

Mr. Leffler was requested to prepare a clause covering Details of Compression Members as a substitute for the tentative clause which was not acceptable to the Committee; and the paragraph covering Built Tension Members was referred to Professor Hudson for like action.

All the remaining general requirements as to details of design were acted on by the Committee, the special requirements covering Plate Girders, Trusses, and Viaducts being postponed until the next meeting.

On motion, duly seconded, the Committee adjourned at 6 P. M., to meet on October 7th, 1921, at 10 A. M., at the Headquarters of the Society.

ITEMS OF INTEREST

This Society is not responsible for any statement made or opinion expressed in its publications.

The Committee on Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

THE ENGINEERING FOUNDATION

The Engineering Foundation was established in 1914 "for the furtherance of research in science and engineering, or for the advancement in any other manner of the Profession of Engineering and the good of mankind", and for the following purposes: To promote and support worthy researches related to engineering in all its branches; to establish and operate engineering research laboratories, if funds be provided therefor; to co-operate with National Research Council and the Engineering Societies in the stimulation and co-ordination of scientific research.

Endowment Funds Needed

The Foundation needs a large increase of endowment. It is obliged frequently to refuse to support research projects brought to it because it lacks funds. Gifts of $1 000 or more are desired. Each donor of $250 000 or more will be honored as a Founder. A gift of $50 000 has been offered contingent on the receipt of nine other gifts of $50 000 each. Gifts to the Foundation are exempt from income tax. A gift for research is a productive investment.

The Foundation is compiling a directory of the hydraulic laboratories of the United States, and is planning an investigation of industrial education and training. It undertakes useful researches which do not promise profits sufficient to tempt industrial organizations to undertake them, researches which should be made under disinterested auspices, and researches which lie outside the province of Government bureaus.

The Engineering Foundation is administered under the auspices of the United Engineering Society, the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, by a board of thirteen representatives of these Societies, and three members at large.

A progress report of the Foundation, a form of Deed of Gift, and other information will be sent by the Secretary, Alfred D. Flinn, M. Am. Soc. C. E., 29 West 39th Street, New York City, on request.

Fall Letting of Highway Contracts

At the request of Herbert C. Hoover, M. Am. Soc. C. E., Secretary of Commerce, a Conference was called on July 18th, 1921, in Washington, D. C., to consider the advisability of letting contracts for road building during the fall months. The Society was represented at this Conference by W. D. Uhler, M. Am. Soc. C. E., Chief Engineer of the State Highway Department of Pennsylvania.

The recommendations of the Conference and a letter from Secretary Hoover to the Governors of the various States, as presented to the Board of Direction at its meeting of October 11th, 1921, with a letter* from Mr. Uhler, are published herewith.

Report on Advisability of Letting Highway Contracts in the Fall Instead of the Spring

It is now general practice in most States to let road-building contracts in the spring. This practice is credited by engineers as being an avoidable waste. For many reasons, given below, if road-building contracts were let in the fall or early winter, these wastes would be avoided.

Fall letting of contracts, this year [1921], would have the added advantage of advancing the road-building programme of the country, which for 1920, outside of towns and cities, involved approximately $450 000 000, and of reducing unemployment.

Approximately 50% of the $450 000 000 for highway improvement for 1920 was expended under the direction of the State highway departments. The remainder is expended under the county and local commissioners.

Financing of Highway Improvements

Fall letting in 1921 for contracts to be started in the late winter and early spring of 1922 involves Federal Aid funds. Adequate funds have been made available for carrying on the joint programme of co-operative road work between the States and Federal Government of most of the States. The last Federal Aid appropriation was allotted to the States on July 1st, 1920.

By December 1st, 1921, there will remain of the entire allotment for Federal Aid funds approximately $58 000 000 not under contract, but of this sum approximately $35 000 000 will remain in 8 States and by December 1st, 1921, it is estimated that 22 States will have all of their Federal funds under contract.

In addition to the highway construction depending on Federal Aid, fall letting of contracts would tend to release road construction funds in towns and cities.

Engineering Advantages of Fall Letting

The advisability of awarding contracts in the late fall or early winter has been an open question for several years, but since the experience of 1919, when a major portion of the country's hard surface highway projects was carried over incompleted to the following year, the plan has been generally favored. The Bureau of Public Roads has encouraged early letting and in a letter from the Chief of the Bureau, Mr. Thomas H. MacDonald, to the State highway departments in October, 1919, its opinion was expressed as follows:

"Contracts should be awarded as early as possible that the contractors may know the amount of materials they will require at different points, and they should be encouraged to place their orders for materials requiring rail trans-

* See p. 866.

portation as far as possible in advance of the time they will be actually required. * * * From the experience of this year, and in view of the greatly increased programme of next year, it seems apparent that contracts which are not awarded during the winter months will have little opportunity of being supplied with materials which require rail hauling."

Transportation service for delivering materials is the difficulty pointed out in the Bureau's approval of fall letting, but this is only one of several factors which the plan affects. These factors, later treated in detail, have an important economic influence on highway building as an individual industry and on other industries which are related to or participate in construction. They are the direct result of establishing first, a longer construction season, and, second, the possibility of doing interseasonal work.

A Longer Construction Season

In the Middle West in the spring letting there were 142 working days for grading and 104 working days for concreting, compared with the longer time in the fall letting, of 207 working days for grading and 142 working days for concreting.

The difference in production cited discloses three principal advantages which may be obtained through a longer working season. These advantages are:

(*a*) Better car service;
(*b*) Less fluctuation in construction;
(*c*) Completion of highway programmes.

Detailed explanation of these items is given in the following paragraphs:

(*a*).—*Better Car Service.*—One of the most vital factors of highway cost has been found by road builders to be continuous transportation. The Bureau of Public Roads in addressing State Highway Departments has said:

"Railroad transportation has become too important a factor in the amount of work which can be accomplished to allow it longer to be regarded as incidental. It has become the biggest item in road production."

A late start in the spring has been found to make the greatest demand for transportation in that industry coincide with the peak demand for transportation in numerous other industries, and some action is needed to make the demand more uniform. In the present condition of the railways their equipment would be inadequate to meet this demand, if the country's industries were operating normally. Recent reports from the American Railroad Association show that the carriers now have 134 000 cars less than at the transportation peak of 1920. In order that shippers may be served satisfactorily, it is necessary to reduce the maximum demand by separating the peak loads of various industries.

Mr. Daniel Willard, President of the Baltimore and Ohio Railroad, said in regard to early shipments:

"I am inclined to believe that the railroads with their existing facilities could perhaps handle all the business offered during a twelve months' period, providing it were offered uniformly throughout the entire period, but that, of course, is exactly what does not happen, and it is certain that the railroads with their present facilities are not able to take care of the possible peak loads, and this is why I think it wise to urge upon all who can do so to ship now."

A start two months earlier in the spring would bring the peak demand for construction transportation that much earlier and would utilize many of the cars now idle at the beginning of each season. Therefore, it may be said that any means whereby the peak demand of late summer can be reduced will afford better transportation service for all shippers. The experience of Illinois would

indicate that such a means has been found in the early start afforded by fall letting of contracts.

(*b*).—*Less Fluctuation in Construction.*—To seasonal fluctuations is attributed a large amount of waste in the construction industry. On account of the speed with which work must be prosecuted to produce a reasonable return on invested capital during a short season, construction companies find it necessary to employ larger equipment units than would otherwise be required. Thus, the equipment expense itself is higher and since it must finally be borne by the total number of units built, the unit cost increases as the seasonal output becomes smaller.

Another consideration is the more or less indeterminate expense of peak production. Work carried on through periods of extreme fluctuation is ordinarily attended by various expenses uncommon to uniform production, and it is generally accepted that as uniformity is approached these somewhat intangible expenses decrease. This principle in some degree applies to road building though to what extent is uncertain. A flattening of the production peak similar to that of transportation demands is anticipated under the longer season afforded by early awards.

(*c*).—*Completion of Highway Programmes.*—Two months added to the present season will increase the working time approximately 25% and with it the seasonal output. This increase combined with constantly improving methods of handling material will in all probability assure the highway departments a satisfactory mileage of roads.

Projects carried over from 1920 in Oregon have produced a condition similar to that obtaining when contracts are awarded in the fall, and in that State according to press reports, the State Highway Department, asserts that construction at present progress will complete all contracts carried over and practically all of the new work.

Illinois also gives evidence of the advantages derived from a similar situation in 1920. The opinion was expressed by the Illinois Division of Highways that, "had the material supply not failed, it would have been possible with the early start of 1920 to build twice the mileage constructed that year, and build it, moreover, without additional administrative charge and with very little additional overhead expense to the constructors."

Interseasonal Work

Interseasonal work under the present system of awarding contracts has not been feasible, but opinions obtained from various associations representing several hundred construction companies have indicated that they could perform certain operations if they knew definitely in advance what work they would undertake in the spring. The advantages of such work as pointed out by the contractors and material producers consulted are:

(*a*) More continuous employment of labor;
(*b*) More uniform production in basic industries;
(*c*) More efficient organizations.

Detailed discussion of these considerations is given in the following paragraphs.

(*a*).—*More Continuous Employment of Labor.*—Under present conditions road-building organizations, with the exception of a few permanent employees, are assembled in the spring and released in the fall as work closes. Probably 20 or 25% of these men could, through careful planning, be carried over the winter instead of being released at a time when other industries do not need their services. The contractors have stated that heavy grading could be carried on, materials could be stock piled, equipment could be repaired, and the material-handling equipment could be set up ready for work at the first opening of spring.

This field of interseasonal work co-ordinated with other types of construction activity and with other industries will contribute efficiently to the reduction of seasonal employment.

(*b*).—*More Uniform Production in Basic Industries.*—To the basic industries which supply materials, the early spring and interseasonal work of road building affords an opportunity for more continuous production. Their problems of seasonal delivery are practically the same as those of a road-building company, and, in general, any benefits which accrue from fall letting are shared by the related industries, in that they afford the same opportunities to organize and develop production which is given the construction company.

Producers of sand and gravel have repeatedly urged that contracts be awarded early so that they might lay plans for an adequate supply of materials. Mr. E. Guy Sutton, Manager of the National Association of Sand and Gravel Producers, who has investigated the subject from the standpoint of the producers, has stated: "that fall letting would increase their season at least two months, would make a certain amount of seasonal work possible and as a result of these things would effect a reduction in production costs."

In many districts the interseasonal work afforded employees of the construction company in storing aggregates and providing for distribution, will call on the material producers for stores of material. In some districts this will mean continuous operation of the basic industries, such as sand, gravel and stone, and, in others, will mean a storage of materials, warranted by the definite plans made for construction. Just as the overhead costs of road building are reduced by the interseasonal work so is the overhead cost of material production reduced. This reduction reflects in the cost of finished roads.

(*c*).—*More Efficient Organizations.*—The effect anticipated by enabling construction companies to carry on interseasonal work is a general reaction towards efficiency. By utilizing as many men as possible on various kinds of preliminary work, a well trained nucleus can be retained, and this nucleus can then be expanded into an efficient organization when operations open in full.

In addition to the better results obtained by a competent crew of mechanics, better opportunity is afforded to investigate the source of materials and plan the work. Thus, much of the late start which has compelled them frequently to purchase materials hastily or begin work before their full need for equipment had been supplied would no longer be necessary. In other words, the efficiency of road building might be made to approximate the efficiency of other well planned and well managed manufacturing, unencumbered by the extreme seasonal fluctuation of construction.

The General Material Situation

The state of the market with reference to contracts is a matter of public policy, and the question will arise concerning the interest of the State in letting contracts on a falling or a rising market. There is an impression that all contracts should be delayed until the market is stable following war conditions. On the other hand, there is another opinion that we are faced in the near future with a rising market, and construction must be given by contracting authorities in this particular question.

In the fall letting of contracts there is a question as to whether the market on materials is in a state that will produce the lowest cost for road construction. It is not desirable to let such contracts at that period of the year when the yearly natural market is a falling one. It has been assumed by some that the cost of road-making materials is generally high in the fall and that by letting contracts at that time the lowest reasonable prices cannot be obtained. There is no record, however, to substantiate that as a fact. An examination of the records of the last few years does not disclose any period of the year as

particularly that of a rising or falling market on the material, and that if a practice is established within a period by a reasonable number of years it will have equalized itself.

Payment for Materials When Delivered

Construction of contracts which permit payment by the State for materials delivered on the job will enable the contractor to provide his stock piles in the winter season, and avoid the pyramiding of orders at high prices. Furthermore, these early contracts give the contractor a chance to "shop." The fall letting permits the highway commissions to keep skilled and satisfactory contractors in the service of the State, and permits the highway commissions to maintain a level organization and staff for the administration of such contracts.

Conclusions

In general, fall letting of highway construction contracts will (1) reduce present unemployment; (2) eliminate seasonal wastes; and (3) tend to stabilize this branch of construction industry.

Letter Sent to Governors of all States by Secretary Hoover on Subject of Road Contracts

"July 27, 1921.

"My dear Governor:

"In making a systematic study as to what we can all do to promote employment and to thus assist in tiding over the very severe situation that we are now in, this Department has had its attention called to the bearing of the period at which contracts are currently let for the building of public roads upon this problem. In order that there should be no question as to the correctness of the conclusions that had been reached, I summoned a committee comprising representatives of the great Engineering Societies who have prepared for me the enclosed opinion.

"The conclusions of this inquiry are in a word that there would be additional economy in construction if the contracts for the roads were let in the fall instead of in the winter and spring; that contracts let at this time would enable considerable employment over the winter in the manufacture of material and equipment and in the placing of material ready for construction early in the spring. It would enable contractors to give employment to some of their staffs through the winter instead of imposing it at a higher rate upon the short summer construction season. It would relieve pressure on labor during the period of larger demand for agricultural help and would, indeed, expedite the completion of road building.

"The criticism that we are in a period of falling prices and possibly of railroad rates, and that contracts let this fall might be at higher figures than would prove necessary later in the season may be answered by making provisional contracts so that any such difference would accrue to the State.

"This method has been partially adopted in a few States and you will, of course, understand that my only desire is to offer a suggestion that by co-operative action might lead to some reduction of unemployment.

"I hope you will find the matter worthy of consideration and would be glad to have you advise me of your views upon it.

"Yours faithfully,

"(Signed) Herbert Hoover."

Dinner Given in Honor of the Delegation of American Engineers to England and France

The engineers forming the American Delegation to England and France, in June, 1921, were guests of honor at a welcome home dinner given at the Pennsylvania Hotel, New York City, on October 10th, 1921. More than 200 engineers, representing American Engineering Societies, were present to extend greetings to the delegates. This delegation consisted of Ambrose Swasey, Chairman; Charles F. Rand, Secretary; Charles T. Main, Robert A. Cummings, and John R. Freeman, representing the American Society of Civil Engineers; Col. Arthur S. Dwight, William Kelly, and Mr. Rand, representing the American Institute of Mining and Metallurgical Engineers; Dr. Ira N. Hollis, Jesse M. Smith, and Mr. Swasey, representing the American Society of Mechanical Engineers; and Dr. F. B. Jewett, Dr. A. E. Kennelly, and Maj.-Gen. G. O. Squier representing the American Institute of Electrical Engineers.

J. Vipond Davies, M. Am. Soc. C. E., President of the United Engineering Society, presided, and, in his opening remarks, stated that the purpose of the gathering was "primarily to extend greetings to our delegation, but, looking beyond this immediate purpose, there is the greater and broader purpose for which these gentlemen went abroad and toward which they have accomplished much, that is, the promotion of international comity and the closer professional relations between our peoples. In honoring our friends, we honor our Profession in the broadest sense of a unified world-wide Profession of Engineering, united in the interest of efficiency and progress."

As to the reasons for the visit abroad, Mr. Davies enumerated three distinct contributary causes:

(1).—To afford British engineers an opportunity to discuss with engineers of the United States the amalgamation of engineering societies along the lines of the United Engineering Society and more recently The Federated American Engineering Societies.

(2).—To show appreciation of the great work done by engineers of England and France in the war.

(3).—To award John Fritz Medals to Sir Robert A. Hadfield, of England, and Charles Prosper Eugene Schneider, of France.

Before introducing the speakers of the evening, Mr. Davies read telegrams and messages from the recipients of the medals, Herbert C. Hoover, M. Am. Soc. C. E., the Institution of Civil Engineers, of London, the Institution of Mining and Metallurgy, the Institution of Mining Engineers, Capt. R. E. Sankey and Magnus Mowett, President and Secretary, respectively, of the Institution of Mechanical Engineers, the British Iron and Steel Institute, Société des Ingénieurs Civils de France, the Engineers' Club of London, the Faraday Society, Viscount Bryce, Arthur Neal, Member of Parliament from Sheffield, and, finally, messages from two of the members of the delegation who have remained abroad, Mr. Smith and Dr. Kennelly.

The first speaker of the evening was the Consul General of Great Britain, Capt. G. H. Armstrong. He felt it to be a responsibility of engineers of the United States, England, and France to draw close together, to promote international friendship between these three countries, and to assist in restoring happiness and regaining prosperity.

Ambrose Swasey, Hon. M. Am. Soc. C. E., Chairman of the delegation, was next introduced as the "Dean of the Engineering Profession". Speaking of the engineers with whom the delegation came in contact while abroad, Mr. Swasey said "their ideas and their problems as engineers are the same as our's; our problems are their's. Therefore, we felt that the nearer we could get together, the better it would be for us all." He enlarged on this thought when, after giving as his general impression that both England and France are well on their way toward a return to normal conditions, he said, in conclusion: "Those countries are near to us; they are nearer to us than ever. Their success means our success; and anything that we can do in bringing not only the engineers, but the citizens of those great countries together, that we can join with them in all these great movements for good and righteousness, it will be that much better for the civilization of to-day."

The Secretary, both of the delegation and of the John Fritz Medal Board of Award, Mr. Rand, outlined the experiences of the delegation in London. These included formal and informal functions—luncheons, dinners, and receptions—a visit to the National Physical Laboratory, the presentation of the John Fritz Medal to Sir Robert A. Hadfield, and meetings with the Councils of the Institution of Mechanical Engineers and the Royal Society. All these events Mr. Rand described in a most entertaining manner. He also spoke of the honors conferred on members of the delegation by various institutions.

Dr. Jewett, who arrived in London some two months in advance of the other members of the delegation, spoke of the preliminary work connected with their visit, all of which was done with the thought that the event was more than a meeting of engineers and exchange of felicitations between the Engineering Professions of America and Great Britain. In his association with engineers of Great Britain during this time, Dr. Jewett was impressed, first, by the fact that the leaders in their engineering societies are older men than those leading the activities of the American societies, and, second, by the greater degree of formality observed in the conduct of their technical meetings.

Two members of the delegation, Mr. Cummings and Mr. Freeman, accepted the invitation of the National Society of Engineers of France to go with members of the Society on their annual excursion to the region of the French Alps. Mr. Freeman gave an account of this trip, the object of which was to view the recent developments in Southeastern France. Among the developments on which Mr. Freeman commented were those in metallurgy and hydro-electric power in the French Alps, and the new harbor works at Marseilles.

A general description of the visit of the delegation to France was given by Col. Dwight. The initial gathering was held in the Eiffel Tower, where a luncheon was served and brief addresses were made. The John Fritz Medal was awarded to M. Schneider at an evening session of the Société des Ingénieurs Civils de France. Later in the month, a large part of the deputation met again at the works of Schneider and Company at Le Creusot. Col. Dwight described briefly this plant, which is the largest and most important of the Schneider works, and the various social functions which took place. He spoke highly of the wonderful *esprit de corps* found in the Schneider plants, which is the result of the care which the Company has taken to develop an intelligent and

enlightened system of industrial welfare work. Col. Dwight, who served overseas through the entire period of the war, found marvelous progress in the work of reconstruction since the Armistice and praised the wonderful spirit of the people of France which "in thousands of quiet ways is working out a solution of the perplexing problems of peace."

M. Gaston Liebert, Consul General of the French Republic, addressed the meeting expressing appreciation of the co-operation and assistance of engineers in this country during the war and summarizing the problems of the French people and the ways in which these problems are being met. He then presented medals which, at the request of M. Schneider and in the name of the French Republic, had been struck off for the following engineers: Messrs. Ambrose Swasey, Charles T. Main, Ira N. Hollis, A. S. Dwight, F. B. Jewett, George S. Webster, Edwin Ludlow, E. S. Carman, and Dr. W. McClellan.

Following this ceremony, Mr. George G. Clapperton, representing the Institution of Electrical Engineers in London, spoke briefly of the growth of that Institution and its desire to work together with engineering bodies of other countries "in softening asperities and leading to that condition of respect, confidence, and esteem between peoples on which rests the hope of mankind."

The final speaker of the evening was Prof. Jacques Cavalier, Exchange Professor from France, who endorsed the idea of the union between the engineers of various countries, but emphasized the difficulty resulting from different languages. He believes that the exchange professorship movement may contribute materially to the union of the engineers of the two countries.

ACTIVITIES OF LOCAL SECTIONS*

Ninety-eighth Regular Meeting of the San Francisco Section

The Ninety-eighth Regular Meeting of the San Francisco Section was held at the Engineers' Club on August 16th, 1921; President F. R. Muhs in the chair; H. D. Dewell, Acting Secretary; and present, also, 114 members and guests.

The Acting Secretary presented a letter from the Secretary of Engineering Council requesting the financial support of the Section to the "B. B. Campaign", and reported that the Board of Directors had recommended that the Section decline to support the movement as a body. No action was taken on the matter, but President Muhs suggested that the members of the Section individually support the Campaign.

In reply to an inquiry from Mr. C. E. Grunsky relative to the disposition made by the Board of Directors of Draft No. 6 of the Federated California Technical Societies and the California Technical Council, the Acting Secretary reported that the matter had been presented to the Board of Directors and that the members of the Board had briefly discussed it, but had made no recommendations relative to the subject. Assurance was given by President Muhs that the matter would receive further consideration at the next meeting of the Board of Directors.

The election of a Secretary-Treasurer to fill the unexpired term of Mr. Nathan A. Bowers, whose resignation was reported at the Ninety-seventh Regular Meeting of the Section, was the next order of business. Mr. Henry D. Dewell was elected to the position, and in a brief address thanked the Section for the honor conferred on him.

On motion, duly seconded, the Section expressed its regret that Mr. Bowers had been compelled to resign his office and its appreciation of his splendid work as Secretary-Treasurer of the Section.

The subject of the evening was "The Proposed San Francisco Bay Crossing." In this connection, Mr. C. H. Snyder spoke on the "General Engineering and Financial Features of a San Francisco Bay Crossing." He discussed the subject in relation to traffic, location of terminals, direction of future growth of city, etc., and presented a plan for a bridge and tunnel which would take care of the vehicular traffic for many years. Mr. Charles Derleth, Jr., discussed "The Probable Effect of Earthquakes on a San Francisco Bay Bridge and Tunnel", in which he stated that "two phases of the subject were to be recognized; first, the condition existing when a structure is on a fault line; and, second, the condition when the structure is at some distance from the fault line, but in the zone of appreciable earth-vibration". In closing his discussion, Prof. Derleth stated that he knew of "no reason to fear the effect of an earthquake on a bridge or tunnel, if properly designed and constructed."

The addresses by Messrs. Snyder and Derleth were followed by a general discussion of the subject in which Messrs. C. E. Grunsky, M. M. O'Shaughnessy, M. C. Couchot, R. S. Chew, H. L. Haehl, Harlan D. Miller, and Col. A. A. Peters took part.

* For list of Local Sections, Officers, etc., see p. 890.

Excursion to the Tunnel of the San Francisco-Sacramento Railroad Through the Berkeley Hills

On September 7th, 1921, at the invitation of Mr. C. M. Mardell, Chief Engineer of the San Francisco-Sacramento Railroad, about 35 members of the Section left on a special train to witness the placing of a pair of concrete ribs for the lining of the tunnel of the Railroad Company through the Berkeley Hills.

The ribs are of pre-cast reinforced concrete about 23 ft. high, approximately 16 by 24 in. in cross-section, and weigh 5 tons each. They are put in place by a specially designed derrick which is mounted on a flat car, the actual time of placing the ribs after they have been transferred to the point of installation is approximately 15 min. All the work was done without interruption to traffic, and the members of the Section greatly appreciated Mr. Mardell's courtesy in permitting them to witness this interesting operation.

Meeting of Colorado Section

The 119th Regular Meeting of the Colorado Section was held at the Denver Athletic Club, on September 9th, 1921; President A. N. Miller in the chair; Walter L. Drager, Secretary; and present, also, 20 members and 7 guests.

President Miller announced the resignation of Mr. J. S. Means as Secretary-Treasurer and the appointment by the Executive Committee of Mr. Walter L. Drager to complete the unexpired term.

The minutes of the meeting of June 13th, 1921, were read and approved.

Mr. A. E. Palen, as Chairman of the Auditing Committee, reported that the books of the retiring Secretary-Treasurer had been audited and found to be correct. On motion, duly seconded, the report was accepted and the Committee discharged.

Abstracts of letters from various Local Sections relative to the proposed revision of the Constitution of the Society were read by the Secretary. The subject was discussed by the members present, but no action was taken.

Mr. George G. Anderson, Director from District No. 11, who was present as one of the guests, extended the greetings from the Los Angeles Section and discussed briefly various topics of general interest to the Society.

Mr. John L. Savage, Engineer of the U. S. Reclamation Service, gave an interesting lecture on the Pueblo Flood, during the course of which he showed numerous lantern slides of the damage done in the Arkansas Valley, and discussed the various plans for flood prevention and river control which have been considered by the Reclamation Service Board of Engineers. Mr. Savage was followed by Mr. James Munn, also a member of the Board, who discussed the subject.

Meeting of Duluth Section

A regular meeting of the Duluth Section was called to order at 12.15 P. M., on October 17th, 1921; Vice-President W. H. Hoyt in the chair; W. G. Zimmermann, Secretary; and present, also, 18 members and 2 guests.

The minutes of the meeting of September 19th, 1921, were read and approved.

The bill recently passed by the Minnesota Legislature for the Licensing of Engineers, Architects, and Land Surveyors, was discussed by the members present. This discussion showed a diversity of opinion among such members as to the value of registration under an optional law by which engineers may continue to practice without a license if they do not use the title, "Licensed Professional Engineers", as provided in the Minnesota Law. The cost of registration and the renewal fees were also discussed.

A discussion of the paper read at the last meeting by Mr. D. A. Reed, on the subject of the Duluth City Water Supply, was then opened by Mr. W. B. Patton who related incidents in regard to the choice and development of the site. Mr. Patton was followed by Mr. Reed who stated that the question of water supply should be taken up as promptly as possible by the proposed City Planning Commission.

Regular Meeting of the Kansas City Section

A regular meeting of the Kansas City Section was held on September 6th, 1921; President Alexander Maitland, Jr., in the chair; Henry C. Tammen, Secretary; and present, also, 22 members and 1 guest.

A resolution passed by the St. Louis Section relative to the proposed Revision of the Constitution of the Society, was read, together with a discussion of the subject by Mr. A. S. Baldwin, a member of the Committee of the Society which drafted the new Constitution. After a general discussion of the subject, it was decided, on motion, duly seconded, that the Section endorse and support the proposed Revision of the Constitution and that the Secretary be instructed to bring the matter before all members of the Section and urge their support of it.

Mr. A. C. Everham, a member of the Section and also Secretary of the Kansas City Engineers' Club, stated that Governor Hyde had asked the Engineers' Club to suggest to him the names of engineers who were competent to serve on the Missouri State Highway Commission. Mr. Everham requested that a committee of the Section be appointed to act with a similar committee of the Engineers' Club in making these recommendations. On motion, duly seconded, the President was instructed to appoint such a committee and, subsequently, Messrs. E. P. Weatherly, G. C. Haydon and H. K. Seltzer were appointed.

The programme for the meeting comprised discussion of the more important projects involved in an $18 000 000 bond issue soon to be voted on in Kansas City.

The question of Water Supply was presented by Mr. Clinton S. Burns and Mr. Charles S. Foreman, First Assistant Engineer of the Water Department of Kansas City. In the course of his remarks, Mr. Burns outlined the investigations made of sources of water supply and described the general features of the proposed plant. Mr. Foreman discussed the need of a new plant and the operation and shortcomings of the present one.

Mr. Paul A. Hartung, Engineer of Sewers of Kansas City, gave an interesting discussion of the proposed Blue Valley Sewer.

Mr. E. M. Stayton outlined the need for a new Armory and presented the various proposals considered in connection with its location and type.

Information regarding a number of street-widening and bridge projects, to be included in the bond issue, was given by Mr. Robert W. Waddell.

The meeting was concluded by Mr. Hart Cummin who described the civic educational work that is being undertaken by the Public Service Institute in Kansas City.

Regular Meeting of the Los Angeles Section

A regular meeting of the Los Angeles Section was called to order at 7.30 P. M., on October 12th, 1921, at the Wilshire Country Club; Vice-President F. D. Howell in the chair; F. G. Dessery, Secretary; and present, also, 49 members and 19 guests.

Mr. F. L. Sellew, Chairman of the Sewer Committee, presented a report of the Committee on the resolution of the Los Angeles Chamber of Commerce relative to sewage disposal, in which the Committee recommended the disapproval of the resolution by the Section. This report, on motion duly seconded, was unanimously adopted as the sentiment of the Section, and the Secretary was instructed to send a copy of it to the Chairman of the Engineers' Advisory Committee of the Chamber of Commerce.

The Secretary read a letter dated October 4th, 1921, from Director George G. Anderson, embodying the following resolution:

"Whereas, H. R. 7541, providing for a commissioned status to Sanitary Engineers, in the U. S. Public Health Service, is now under consideration by the Committee on Interstate and Foreign Service; and

"Whereas, Such provision is desirable and necessary in order that the Government may command the services of Engineers of the qualifications required to advance the Public Health Service, and no additional appropriations or expenditure of funds are contemplated by the Act;

"Be it Resolved, That the Los Angeles Section, American Society of Civil Engineers, approve and endorse the measure, and instruct the Secretary to send copies of the resolution to Hon. Samuel E. Winslow, Chairman of the Committee on Interstate and Foreign Service, to the Board of Direction, to all other Local Sections, and that the individual members communicate with members of Congress urging their assistance to secure the speedy enactment of the measure."

On motion, duly seconded, this resolution was unanimously adopted.

The topic of the evening, "The Work of the Los Angeles City Planning Commission", was introduced by Mr. W. S. Post who outlined the work of the Commission, pointing out its engineering features. The subject was discussed in detail by Messrs. Sumner P. Hunt, H. Lichtenberger, G. Gordon Whitnall, J. R. Prince, E. G. Sheibley, W. D. Smith, Charles H. Cheney, John A. Richert, Robert M. Allan and Jesse E. Stephens.

Mr. W. D. Smith, of the City Planning Committee, to which the matter of the location of the new Public Library was referred, presented the following resolution:

"Be it Resolved, That the Los Angeles Section, American Society of Civil Engineers, is opposed to the location of the Public Library in Pershing Square, and that this Section is opposed to the construction of the Public Library in

any location which will or may block the opening of Park Boulevard, and that this Section favors Normal Hill as the site for the Public Library; and

"Be it Further Resolved, That the Los Angeles Section, American Society of Civil Engineers, is strongly in favor of the use of the proposed hotel site at Fifth and Olive Streets for public purposes and as a part of the future civic or cultural center of the City."

This resolution was unanimously adopted, and the Secretary was instructed to forward a copy of it to the City Planning Commission.

A progress report of the finances of the Section was presented by Treasurer E. R. Bowen, and Vice-President Howell announced the result of the vote on the amendments to the Constitution canvassed at the meeting of the Society on October 5th, 1921.

Vice-President Howell introduced Mr. Charles G. Patrick as a new member of the Section.

On motion, duly seconded, a vote of thanks was extended to the speakers who furnished the evening's entertainment.

Meeting of the St. Louis Section

The 106th Regular Meeting of the St. Louis Section was called to order at the American Annex Hotel, on October 24th, 1921; Vice-President E. B. Fay in the chair; W. R. Crecelius, Secretary; and present, also, 18 members.

The minutes of the meeting of September 26th, 1921, were read and approved.

The Secretary read communications from the Los Angeles Section, the Engineers' Club of Columbus, Ohio, and from the Acting Secretary of the Society relative to the status of engineers in the U. S. Public Health Service, together with enclosed resolutions favoring the bill now before Congress.

Col. J. A. Ockerson, representing the Section on the Committee of the Chamber of Commerce to consider the proposed new Constitution for the State of Missouri, reported on the activities of that Committee. It was moved and carried that it is the opinion of the Section that an engineer should be selected as a delegate to the State Constitutional Convention.

The Nominating Committee reported on the nominations for officers of the Section for 1922.

The discussion opened at the September meeting on the subject "Should the Construction of New Public Works Await Lower Material Prices and Wages?", was continued. In this connection, Mr. J. W. Skelly presented a letter from the Associated Retailers enclosing a speech by Mr. Louis P. Aloe, President of the Board of Aldermen, advocating an immediate bond issue for the relief of unemployment, and, on motion, duly seconded, this communication was received and ordered filed. A general discussion of the construction of new public works followed, which was participated in by Messrs. Brown, Marks, Stoecker, Garrett, Phillips, Baker, Ockerson, and Fay. In the course of his discussion, Mr. Brown advocated a new bond issue for the construction of new public works next summer when labor and material prices are expected to be somewhat lower. The trend of the discussion seemed to indicate the general opinion that considerable reduction in both labor rates and material prices may be expected in the near future.

EMPLOYMENT SERVICE OF THE FEDERATED AMERICAN ENGINEERING SOCIETIES

An Engineering Societies Service Bureau was established December 1st, 1918, as an activity of Engineering Council, managed by a board made up of the Secretaries of the four Founder Societies, funds for its maintenance being provided by these Societies. On January 1st, 1921, this Bureau was taken over by The Federated American Engineering Societies and is now known as the Employment Service of that organization. It is co-operating with engineering organizations in all parts of the country and is desirous of increasing such co-operation by working with local engineering associations and clubs. Members of the American Society of Civil Engineers who desire to register should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings*, copy must be received on or before the first Wednesday of each month. All communications should be addressed to Mr. Brown.

EMPLOYMENT BULLETIN

POSITIONS AVAILABLE

YOUNG MEN to learn business, with a view to sales. Men are sent to the factory for from six months to a year, where they are trained in manufacture of building products, working from department to department through the plant. At all times, while at the factory, they are available to the Sales Organization when in need of men. Location, New York City; Factory, Va. X–848.

DESIGNER for concrete mixers. Experience in this work essential. Location, Pa. X–1104.

SALESMEN to sell concrete mixers and similar contractors' equipment. Also, gasoline engine experience desirable or will consider salesman with gasoline engine experience only. Location, New York City. X–1105.

DESIGNER for dredges, cranes, etc. Also, steam engine or steam pump design. Boiler-plate and structural steel experience desirable. Location, Pa. X–1213.

INSTRUCTOR, preferably with previous teaching experience in Theoretical Mechanics and Mechanics of Materials, for State university. Location, South. X–1214.

MEN AVAILABLE

MANAGER OR REPRESENTATIVE, Assoc. M. Am. Soc. C. E., age 37. Sixteen years' experience in all branches of engineering and construction, including municipal, power-plant installation, all classes of building construction, and road work. Has held all the various positions, including those of superintendent and manager. Three years as Captain in the Construction Division of the Army, duties covered construction in all sections of the country. Capable organizer and executive and able to transact business along modern methods. Now located in the Pacific Northwest, will consider any location, even foreign countries. Will act as representative for an engineering or construction firm for a small salary and a percentage of the profits. CE–270.

GRADUATE ENGINEER, Assoc. M. Am. Soc. C. E., age 36, married. Fifteen years' general experience: railway maintenance, construction, and location; Panama Canal; design of factory buildings and rubber machinery; design and construction of bridges; management of highway construction; design and construction water-works plant; testing laboratory experience, physical, chemical, electrical. Prefers South, but will go anywhere, including tropics. Salary $250 month, or less, depending on conditions. Present residence, Akron, Ohio. CE–271.

CIVIL ENGINEER, Assoc. M. Soc. C. E., age 34, married. Ten years' experience in structural and mechanical lines, including design and equipment, structural steel and sheet metal work for mill buildings, towers, trestles, breechings, etc. Also, has had considerable experience in development of warped surfaces and skewed connections, as well as checking, estimating, inspecting, and field superintendence of work. New York City and vicinity preferred. CE–272.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E., technical education, age 36. Twelve years' experience on responsible work, as follows: Filter plant design and construction, railroad location and construction, surveys and investigations, location and construction of heavy highway work, drainage work, and concrete bridge design and construction. Competent and experienced in both field and office work. Capable of executive position. Exceptionally well fitted for contractor on highway work or bridges. Willing to go anywhere. Excellent record and references. CE–275.

DESIGNER, Assoc. M. Am. Soc. C. E., technical graduate, age 38, married. Fifteen years' experience on large hydro-electric, water supply, sewerage, and industrial building developments. Refer to past employers. Location in or near New York City. CE–276.

GRADUATE CIVIL ENGINEER AND CONSTRUCTION SUPERINTENDENT, Assoc M. Am. Soc. C. E., age 34, degree, 1908. Twelve years' experience, roads, bridges, surveys, sewers, water-works, and concrete industrial buildings. Experience includes design, inspection, and superintendence. Two years in charge of war work for Construction Division, U. S. A. Available at once. Location immaterial. CE–273.

CIVIL ENGINEER, M. Am. Soc. C. E., technical graduate, age 35. Twelve years' broad experience, designing and constructing all types of structures, subways, viaducts, and industrial plants, steel and reinforced concrete buildings, water supply, sewer systems, boiler house, piers, railways, and highways. Has been in charge of designs, estimating, and construction work. Capable organizer and executive. CE–274.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 6 P. M., and from 7 P. M. to 10 P. M., every day, except Sundays, New Year's Day, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 6 P. M.

FUTURE MEETINGS

December 7th and 8th, 1921.—Discussion of the Progress Report of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete.

The Tentative Specifications for Concrete and Reinforced Concrete, contained in the Progress Report of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete, published in *Proceedings* for August, 1921, pp. 59-124, will be discussed at meetings of the Society held on December 7th and 8th, 1921. There will be six sessions, at which portions of the Report will be considered tentatively as follows:

December 7th, 9 A. M.—Chapter IX, Water-Proofing and Protective Treatment.
Chapter X, Surface Finish.
2 P. M.—Chapter VI, Depositing Concrete.
Chapter VII, Forms.
Chapter VIII, Details of Construction.
8 P. M.—Regular Business Meeting of the Society.
Chapter XI, Design.

December 8th, 9 A. M.—Continuation of discussion of Chapters VIII and XI.
2 P. M.—General discussion of the Tentative Specifications for Concrete and Reinforced Concrete and of the scope of the Joint Committee's work.
8 P. M.—Chapter III, Quality of Concrete.
Chapter IV, Materials.
Chapter V, Proportioning and Mixing Concrete.

SECOND MEETINGS OF THE MONTH

Under authority given by the Board of Direction at its meeting of August 9th, 1920, the Acting Secretary has made an arrangement with the New York Section whereby the latter will take over the second meeting of the month, and will thus hold its own meetings on the third Wednesday of each month, except January and May, when they are held on the second Wednesday.

The programmes of the New York Section* are similar to those heretofore offered by the Society's Committee on Second Meeting of the Month, and it is

* *Proceedings*, Am. Soc. C. E., October, 1921, p. 803.

understood that all members of the Society are invited to attend the meetings regardless of whether or not they may be members of the Section. This arrangement gives each member the same privilege of attendance at meetings which he has heretofore enjoyed, and is deemed especially desirable since there has been considerable doubt as to the attendance that might develop at the several meetings if three were held in each month.

ANNUAL MEETING

The Sixty-ninth Annual Meeting will be held at the Headquarters of the Society, 33 West 39th Street, New York City, on Wednesday, Thursday, and Friday, January 18th, 19th, and 20th, 1922.*

"TRANSACTIONS" FOR SALE

It is possible to secure a fairly complete set of the *Transactions* of the Society for a very reasonable price as, owing to limited storage space, the Board of Direction has decided to dispose as rapidly as possible of surplus stock.

Some volumes are entirely out of print. Of those available, the following can now be furnished to *members of the Society* for the prices noted:

Vols. 2, 6, 9-10, 15-20, 22, 24-27, 29-42, 44.....	(30 Vols.)	$50
" 45, 49-53, Parts A-F of 54, 55-67, 69-70, 72-79.....	(35 ")	$50

It is suggested that members wishing these volumes send in their orders promptly, as the supply of certain of them is limited. Requests will be filled in order of receipt.

A deduction of $2 per volume will be made for any volume out of print when the order is received.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 21 of the Year Book for 1921.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper. Written discussion on a given paper will be closed three months after the paper has been published, so that the author's closure can be printed four months after the paper.

All manuscripts submitted for publication should preferably be typewritten, and always double spaced. Drawings and diagrams should be on separate sheets, drawn to a scale suitable for about one-half to one-fourth reduction.

* For tentative programme for Annual Meeting, see p. 867.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 36 of the Year Book for 1921.

LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Section (Constitution Approved by Board, 1905).

Frederick R. Muhs, President; H. D. Dewell, Secretary-Treasurer, 503 Market Street, San Francisco, Cal.

Bi-monthly meetings are held at 6 P. M., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting. Informal luncheons are held at noon, every Wednesday, at the Engineers' Club. All members of the Society will be gladly welcomed.

Colorado Section (Constitution Approved by Board, 1909).

A. N. Miller, President; Walter L. Drager, Secretary-Treasurer, 412 Tramway Building, Denver, Colo.

Meetings are held on the second Monday of each month, except July and August, usually preceded by an informal dinner. Weekly luncheons are held on Wednesday, at 12.30 P. M., at Daniels and Fisher's. Visiting members of the Society are urged to attend.

Atlanta Section (Constitution Approved by Board, 1912).

J. T. Wardlaw, President; R. S. Fiske, Secretary-Treasurer, 1530 Healey Building, Atlanta, Ga.

Informal luncheons are held on the second Tuesday of each month, at 1.00 P. M., at the Ansley Hotel, to which visiting members of the Society are welcome. Visitors desiring information will telephone the Secretary, "Ivy 3605."

Baltimore Section (Constitution Approved by Board, 1914).

Ezra B. Whitman, President; George S. Robertson, Sr., Secretary-Treasurer, 1628 Linden Avenue, Baltimore, Md.

Buffalo Section (Constitution Approved by Board, 1921).

A. L. Johnson, President; Bruce L. Cushing, Secretary-Treasurer, 80 West Genesee Street, Buffalo, N. Y.

Central Ohio Section (Constitution Approved by Board, 1921).

F. H. Eno, President; H. D. Bruning, Secretary, 935 Madison Avenue, Columbus, Ohio.

Meetings are held at the rooms of the Engineers' Club of Columbus in the Southern Hotel. The Annual Meeting is held on the second Friday of November and at least two other meetings are held each year the dates of which are designated by the Board of Direction of the Section.

Cincinnati Section (Constitution Approved by Board, 1920).

Edgar Dow Gilman, President; Alphonse M. Westenhoff, Secretary, 13 East Third Street, Cincinnati, Ohio.

Cleveland Section (Constitution Approved by Board, 1915).

J. E. A. Moore, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

Regular meetings are held on the second Wednesday of each month, at 12.15 P. M., in the rooms of the Section, Hotel Winton. Luncheon is served, and all visiting members of the Society are invited to attend.

Connecticut Section (Constitution Approved by Board, 1919).

Charles Rufus Harte, President; Clarence M. Blair, Secretary-Treasurer, 785 Edgewood Avenue, New Haven, Conn.

The Annual Meeting is held in April; fortnightly meetings alternate between Hartford and New Haven, Conn. These meetings are informal luncheon gatherings, held usually at noon on Saturday. Members are privileged to invite guests regardless of their affiliation as engineers.

Detroit Section (Constitution Approved by Board, 1916).

David A. Molitor, President; Dalton R. Wells, Secretary-Treasurer, 624 McKerchey Building, Detroit, Mich.

Regular meetings are held on the second Friday of December, April, and October, the last being the Annual Meeting.

District of Columbia Section (Constitution Approved by Board, 1916).

John C. Hoyt, President; James H. Van Wagenen, Secretary-Treasurer, 2001 Sixteenth Street, N. W., Washington, D. C.

Duluth Section (Constitution Approved by Board, 1917).

John L. Pickles, President; Walter G. Zimmermann, Secretary, 203 Wolvin Building, Duluth, Minn.

Regular meetings are held at noon on the third Monday of each month, usually at the Kitchi Gammi Club, to which visiting members of the Society will be welcomed. The Annual Meeting is held on the third Monday in May.

Illinois Section (Constitution Approved by Board, 1916).

Charles B. Burdick, President; W. D. Gerber, Secretary-Treasurer, 918 Chamber of Commerce, Chicago, Ill.

Regular meetings are held on the second Monday of March, June, September, and December, the last being the Annual Meeting.

Iowa Section (Constitution Approved by Board, 1920).

C. S. Nichols, President; R. W. Crum, Secretary, Care, Iowa State Highway Commission, Ames, Iowa.

Kansas City (Mo.) Section (Constitution Approved by Board, 1921).

Alexander Maitland, Jr., President; Henry C. Tammen, Secretary-Treasurer, 1012 Baltimore Avenue, Kansas City, Mo.

Regular meetings of the Section are held on the first Tuesday of March, June, September, and December, the last being the Annual Meeting. The

members of the Kansas City Engineers' Club meet at luncheon at the University Club every Tuesday from 12 M. to 2 P. M., and all members of the Society are invited to attend these luncheons.

Kansas Section (Constitution Approved by Board, 1920).

L. E. Conrad, President; Frank S. Altman, Secretary-Treasurer, 1114 Garfield Avenue, Topeka, Kans.

Los Angeles Section (Constitution Approved by Board, 1913).

H. W. Dennis, President; Floyd G. Dessery, Secretary, 619 Central Building, Los Angeles, Cal.

Regular monthly meetings are held on the second Wednesday of each month, the Annual Meeting in December. Informal luncheons in connection with the Joint Technical Societies of Los Angeles are held at 12.15 P. M., every Thursday at the Broadway Department Store Café.

Louisiana Section (Constitution Approved by Board, 1914).

Ole K. Olsen, President; F. A. Muth, Secretary, 224 Custom House Building, New Orleans, La.

Regular meetings are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

Nashville Section (Constitution Approved by Board, 1921).

Arthur J. Dyer, President; Granbery Jackson, Secretary-Treasurer, 220 Capitol Boulevard, Nashville, Tenn.

Nebraska Section (Constitution Approved by Board, 1917).

Rodman M. Brown, President; Homer V. Knouse, Secretary-Treasurer, 200 City Hall, Omaha, Nebr.

Regular meetings are held on the first Saturday of each month, except July and August. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January. Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

New York Section (Constitution Approved by Board, 1920).

Nelson P. Lewis, President; J. P. J. Williams, Secretary, 33 West 39th Street, New York City.

Regular meetings are held in the Engineering Societies Building, 29 West 39th Street, New York City, on the third Wednesday of each month, except January and the Annual Meeting in May, held on the second Wednesday of the month.

Northwestern Section (Constitution Approved by Board, 1914).

Charles L. Pillsbury, President; Paul C. Gauger, Secretary, 945 Osceola Avenue, St. Paul, Minn.

Meetings are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month.

Oklahoma Section (Constitution Approved by Board, 1920).

H. V. Hinckley, President; R. E. Brownell, Secretary-Treasurer, 401 First National Bank Building, Oklahoma, Okla.

Philadelphia Section (Constitution Approved by Board, 1913).

John Meigs, President; S. C. Hollister, Secretary, 1200 Land Title Building, Philadelphia, Pa.

Regular meetings are held at the Engineers' Club on the first Monday in January, April, and October, the last being the Annual Meeting. Special meetings are also held at times announced in advance.

Pittsburgh Section (Constitution Approved by Board, 1918).

N. S. Sprague, President; Nathan Schein, Secretary-Treasurer, 1510 Carson Street, Pittsburgh, Pa.

Portland (Ore.) Section (Constitution Approved by Board, 1913).

M. E. Reed, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

Meetings are held regularly on the third Friday of each month. All members of the Society in any grade are cordially invited to attend.

Providence (R. I.) Section (Constitution Approved by Board, 1920).

Sydney Wilmot, Chairman; Robert L. Bowen, Secretary-Treasurer, 26 Sycamore Street, Providence, R. I.

The Section regularly holds meetings jointly with the Structural and Municipal Sections of the Providence Engineering Society, at the Society Rooms, 29 Waterman Street, on the fourth Tuesday of each month, from September to May. The Annual Meeting is held in May. All visiting members of the Society are cordially invited to attend these meetings.

St. Louis Section (Constitution Approved by Board, 1914).

William S. Mitchell, President; W. R. Crecelius, Secretary-Treasurer, 301 City Hall, St. Louis, Mo.

The Annual Meeting is held on the fourth Monday in November. Two meetings each year for the presentation and discussion of technical papers are held in the Auditorium of the Engineers' Club, and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

San Diego Section (Constitution Approved by Board, 1915).

F. J. Grumm, President; J. Y. Jewett, Secretary-Treasurer, Administration Building, Balboa Park, San Diego, Cal.

Regular meetings are held on the third Tuesday of each month at the Chamber of Commerce. Visiting members of the Society are invited to attend.

Seattle Section (Constitution Approved by Board, 1913).

T. E. Phipps, President; Frank H. Fowler, Secretary-Treasurer, 1319 L. C. Smith Building, Seattle, Wash.

Regular meetings, with luncheon, are held at the Engineers' Club, on the last Monday of each month. All members in any grade of the Society are cordially invited to attend, and if located in this District for any length of time, their membership in the Section will be appreciated.

Spokane Section (Constitution Approved by Board, 1914).

E. G. Taber, President; Charles E. Davis, Secretary-Treasurer, 401 City Hall, Spokane, Wash.

Meetings are held on the second Friday of each month. These meetings are noonday luncheons at Davenport's, and all visiting members of the Society are invited to attend.

Texas Section (Constitution Approved by Board, 1913).

J. H. Brillhart, President; E. N. Noyes, Secretary, 1107 Dallas County Bank Building, Dallas, Tex.

Utah Section (Constitution Approved by Board, 1916).

W. R. Armstrong, President; H. S. Kleinschmidt, Secretary-Treasurer, 222 Felt Building, Salt Lake City, Utah.

The Annual Meeting is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the Secretary.

STUDENT CHAPTERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS*

Leland Stanford, Jr., University Student Chapter, Organized 1920.

R. L. Wing, President; John H. Colton, Corresponding Secretary, Box 121, Stanford, Cal.

Alabama Polytechnic Institute Student Chapter, Organized 1921.

Alfred D. Boyd, Secretary, Alabama Polytechnic Institute, Auburn, Ala.

Braune Civil Engineering Society (University of Cincinnati) Student Chapter, Organized 1920.

John W. Guilday, President; C. A. Harrell, Secretary of Section I; R. Blickensderfer, Secretary of Section II; University of Cincinnati, Cincinnati, Ohio.

California Institute of Technology Student Chapter, Organized 1921.

J. Arthur Macdonald, Secretary, California Institute of Technology, Pasadena, Cal.

Civil Engineering Society of Rensselaer Polytechnic Institute Student Chapter, Organized 1920.

William Minot Thomas, President; T. W. Broughton, Secretary, 2165 Fourteenth Street, Troy, N. Y.

Cornell University Student Chapter, Organized 1921.

John J. Chavanne, Jr., Secretary, Cornell University, Ithaca, N. Y.

Drexel Institute Student Chapter, Organized 1920.

C. V. Nishwitz, Chairman; Raymond Radbill, Secretary, Drexel Institute, Philadelphia, Pa.

Iowa State College Student Chapter, Organized 1920.

Alfred W. Warren, Secretary, Iowa State College, Ames, Iowa.

Johns Hopkins University Student Chapter, Organized 1921.

Eric M. Arndt, President; Melvin E. Scheidt, Secretary, Box 566, Homewood, Baltimore, Md.

Massachusetts Institute of Technology Student Chapter, Organized 1921.

D. H. McCreery, President; T. S. Wray, Secretary, Massachusetts Institute of Technology, Cambridge, Mass.

New York University Student Chapter, Organized 1921.

William J. Kiehnle, President; George H. Martin, Jr., Secretary, New York University, University Heights, New York City.

Oregon State Agricultural College Student Chapter, Organized 1921.

John B. Alexander, Secretary, Omega Upsilon House, Oregon State Agricultural College, Corvallis, Ore.

* By a recent ruling of the Board of Direction, the minimum membership of a Student Chapter has been fixed at 12 instead of 20.

Pennsylvania State College Student Chapter, Organized 1920.

Arthur H. McFadden, President; William W. Seltzer, Secretary, Pennsylvania State College, State College, Pa.

Polytechnic Institute of Brooklyn Student Chapter, Organized 1921.

Richard Kanegsberg, Secretary, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

Purdue University Student Chapter, Organized 1921.

Donald A. Leach, President, 208 Fowler Avenue, West Lafayette, Ind.

Rose Polytechnic Institute Student Chapter, Organized 1921.

Kenneth L. De Blois, President; Duncan Baker, Secretary, 1606 North Eighth Street, Terre Haute, Ind.

Rutgers College Student Chapter, Organized 1921.

L. C. Kuhl, President; A. C. Ely, Secretary, 105 Winants Hall, Rutgers College, New Brunswick, N. J.

State University of Iowa Student Chapter, Organized 1921.

C. E. Stickney, Secretary, State University of Iowa, Iowa City, Iowa.

Swarthmore College Student Chapter, Organized 1921.

Frank Lemke, President; H. Chandler Turner, Jr., Secretary, Swarthmore College, Swarthmore, Pa.

Syracuse University Student Chapter, Organized 1921.

Arthur V. Dollard, Secretary, College of Applied Science, Syracuse University, Syracuse, N. Y.

University of Calfornia Student Chapter, Organized 1921.

H. G. Gerdes, Secretary, Care, Prof. Charles Derleth, Jr., College of Civil Engineering, University of California, Berkeley, Cal.

University of Colorado Civil Engineering Society Student Chapter, Organized 1920.

W. C. Peterson, President; D. H. McNeal, Secretary, 1205 Thirteenth Street, Boulder, Colo.

University of Illinois Student Chapter, Organized 1921.

A. L. R. Sanders, President; M. E. Jansson, Secretary, University of Illinois, Urbana, Ill.

University of Kansas Student Chapter, Organized 1921.

Waldo G. Bowman, Secretary, 1106 Ohio Street, Lawrence, Kans.

University of Kentucky Student Chapter, Organized 1921.

B. O. Bartee, Secretary, University of Kentucky, Lexington, Ky.

University of Maine Student Chapter, Organized 1921.

George H. Ferguson, Jr., Secretary, University of Maine, Orono, Me.

University of Minnesota Student Chapter, Organized 1921.

C. L. Swanson, President, 1716 Tyler Street, N. E., Minneapolis, Minn.

University of Nebraska Student Chapter, Organized 1921.

L. Kent Holloway, Secretary, University of Nebraska, Lincoln, Nebr.

University of Pennsylvania Student Chapter, Organized 1920.

Charles W. Foppert, President; Fred Welchy, Secretary, University of Pennsylvania, Philadelphia, Pa.

University of Pittsburgh Student Chapter, Organized 1921.

W. E. Marshall, President; J. M. Daniels, Secretary, University of Pittsburgh, Pittsburgh, Pa.

University of Texas Student Chapter, Organized 1921.

W. H. D. Taylor, President; Phil M. Ferguson, Secretary, 511 West 19th Street, Austin, Tex.

University of Washington Student Chapter, Organized 1921.

G. B. Richardson, President; G. E. Large, Secretary, 4518 Eleventh Avenue, N. E., Seattle, Wash.

University of Wisconsin Student Chapter, Organized 1921.

Herbert Wheaton, President; Olaf N. Rove, Secretary, University of Wisconsin, Madison, Wis.

Virginia Military Institute Student Chapter, Organized 1921.

Benjamin F. Parrott, Secretary, Virginia Military Institute, Lexington, Va.

Washington University Collimation Club Student Chapter, Organized 1920.

William D. Rolfe, President; Erwin Bloss, Secretary, Washington University, St. Louis, Mo.

Yale University Student Chapter, Organized 1921.

W. G. Geile, President; P. W. Thompson, Secretary, Winchester Hall, New Haven, Conn.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcome in the Reading Rooms and at the meetings of many engineering societies in all parts of the world. A list of such societies will be found on pages 48, 49, and 50 of the Year Book of the Society for 1921.

NEW BOOKS*

(From October 1st to October 31st, 1921)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

DONATIONS TO ENGINEERING SOCIETIES LIBRARY

MODERN CENTRAL STATIONS.

By Charles W. Marshall. (Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 115 pp., illus., 6 x 4 in., cloth. 85 cents.

A brief description of the principal features of British central station practice, intended for young engineers. Includes the coal and ash-handling plant, boiler house, engine room, switch and protective gear, plant operation, and testing.

ELECTRICAL TRANSMISSION OF PHOTOGRAPHS.

By Marcus J. Martin. Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 136 pp., illus., diagrams, 7 x 5 in., cloth. $2.00.

A brief description of the various systems devised for the transmission of photographs over metallic conductors, and of the principles underlying them. Chapters on television and on the wireless transmission of photographs are added, as is also one containing full working drawings for an experimental transmitting or receiving machine.

FIRST PRINCIPLES OF ELECTRICAL TRANSMISSION OF ENERGY.

By W. M. Thornton. (Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 116 pp., diagrams, 6 x 4 in., cloth. 85 cents.

This book is the substance of a course of six lectures given to an audience of practical engineers and students. The subject is presented from the viewpoint of the electron, not yet usual in engineering literature.

AMERICAN ELECTRICIAN'S HANDBOOK.

By Terrell Croft. Second Edition. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 823 pp., illus., 7 x 4 in., fabrikoid. $4.00.

A collection of the information needed by wiremen, contractors, linemen, small plant superintendents, operators, and construction engineers, in selecting, installing and operating commercial electrical apparatus for the performance of various duties. This edition has been carefully revised throughout, obsolete matter discarded, new matter added, and many parts have been rewritten.

BERICHTE UND ABHANDLUNGEN DER WISSENSCHAFTLICHEN GESELLSCHAFT

Für Luftfahrt. (Beihefte zur *Zeitschrift Flugtechnik und Motorluftschiffahrt,* 4 Heft, April 1921.) München, R. Oldenbourg. 81 pp., illus., 12 x 9 in., paper. 32 marks.

This supplement contains the proceedings of the sixth meeting of the Society, at Charlottenburg, October 15, 1920. In addition to the official actions of the meeting, it contains the technical papers presented, which treat of the relation between the design of power plants for aircraft and safety in flight. The results of research in aerology and atmospheric electricity by flights, the formation of eddies by planes, and advances in space telegraphy and telephony.

STEAM BOILERS.

By Terrell Croft. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 412 pp., illus., 8 x 6 in., cloth. $4.00.

This book has been compiled for men of little schooling who wish to inform themselves about the construction and operation of steam boilers, especially those preparing for examinations for engineers licenses. It treats of the functions, history, and modern types of boilers, boiler construction, accessories, steam generation, superheating, fuels, settings, furnaces, feed-waters, boiler-room equipment, inspection, and management, in clear, simple language.

PNEUMATIC CONVEYING.

By E. G. Phillips. (Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 108 pp., illus., 6 x 4 in., cloth. $.85.

A general survey of the information available on machinery and methods for handling coal, ashes, grain, and other heavy solids, with brief references to air-lift pumping, vacuum cleaning, etc.

* Unless otherwise specified, books in this list have been donated by the publishers.

MECHANISM.

By Robert McArdle Keown. Second Edition. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 173 pp., illus., diagrams, 9 x 6 in., cloth. $2.25.

A brief course for students of engineering. Commences with a short discussion of motions and velocities, which is followed by a study of linkages, cams, gearing, belting, and intermittent motions. In this revision difficult points have been made clearer and many problems have been added.

GRINDING MACHINES AND THEIR USE.

By Thomas R. Shaw. (Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 114 pp., illus., 6 x 4 in., cloth. 85 cents.

A concise review of the main principles of workshop precision grinding, based on long experience in the design and construction of grinding machines and close observation of their utility. Suitable as an introduction to the subject.

DRAWING ROOM PRACTICE.

By Frank A. Stanley. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 253 pp., illus., 9 x 6 in., cloth. $2.50.

This book deals with the making of drawings, from the simplest constructions to complete assembly and working drawings of various classes. It is based on experience in a number of leading American and European drawing rooms, and in teaching students. The difficulty in visualizing the work represented by a drawing, which many students undergo, has led the author to present photographs of the objects represented by the working drawings discussed in the book.

GESUNDHEITS-INGENIEUR:

Festnummer, Juli, 1921. München, R. Oldenbourg. 52 pp., 13 x 10 in., paper. 10 marks.

This "Festnummer" was issued to commemorate the Tenth Convention of Heating and Ventilating Engineers, at Munich, in July, 1921. Papers on the heating and ventilating plant of the new Rathaus at Barmen, methods of utilizing waste heat, the development of electric heating in Switzerland and an extensive system of central heating are included, together with others on the general subject.

GAS-WOCHE:

Sonderheft der Zeitschrift *Das Gas- und Wasserfach.* 48 pp., 13 x 10 in., paper. 12 marks.

This special number of *Das Gas- und Wasserfach,* issued in connection with the convention of gas manufacturers held at Krummhübel in June, 1921, contains a number of papers of interest to those connected with the industry, of a technical and economic nature.

TEMPERATURE INDICATING AND CONTROLLING SYSTEMS.

By Franklin D. Jones. N. Y., Industrial Press, 1921. 59 pp., illus., 9 x 6 in., paper. 50 cents.

A general review of the application of thermo-electric pyrometers to the heat-treatment of steel parts. The methods and apparatus used in various plants to indicate, control and record temperature are described and illustrated.

THE WORKING OF STEEL.

By Fred H. Colvin and K. A. Juthe. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 245 pp., illus., 9 x 6 in., cloth. $4.00.

The authors have collected, from their own experience and that of others, information on the most approved methods of working the various kinds of steel in use to-day. These include low-carbon, high-carbon, and alloy steels of various kinds and from a variety of industries. The book discusses the chemical and physical properties of steels, forging, annealing, case-hardening, heat treatment, and hardening.

CHEMICAL AND METALLOGRAPHIC EXAMINATION OF IRON, STEEL, AND BRASS.

By William T. Hall and Robert S. Williams. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 501 pp., illus., 8 x 5 in., cloth. $5.00.

This work is divided into two parts. The first gives a careful selection of methods for the chemical analysis of iron and steel, brass and bronze. Special attention is given to explanation of the chemical reactions involved in the methods given and to the discussion of their accuracy. Emphasis is placed on those that are both accurate and rapid. Part 2 considers the physical inspection of metals. In it the methods for preparing and examining polished surfaces are described. A brief introduction to metallography, as applied to the inspection of alloys, is included.

INTRODUCTION TO THE STUDY OF MINERALS AND ROCKS.

By Austin Flint Rogers. Second Edition. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 527 pp., illus., 7 x 5 in., fabrikoid. $4.00.

This textbook is intended as a textbook for a year's work in the study of minerals and rocks, and also as a field manual of convenient size and scope. The first part describes the chemical, morphological, and physical properties of minerals. Part 2 contains the description of 175 minerals, including all the common ones and most of those of any special economic, geological, or scientific importance. Part 3 is an elementary discussion of the occurrence, association and origin of minerals, and Part 4 contains two tables for the determination of minerals; one depending on crystal form and physical properties, and suited to field use, the other confined to laboratory use.

TEXTBOOK OF GEOLOGY.

By Philip Lake and R. H. Rastall. Third Edition. Lond., Edward Arnold, 1920. 508 pp. pl., illus., 9 x 6 in., cloth. $7.50. (Gift of Longmans, Green & Co.)

A textbook that fills the gap between elementary books and standard reference authorities, particularly full in its references to the geology of the British Isles. This edition has been considerably altered and revised throughout.

ANALYTICAL MECHANICS FOR ENGINEERS.

By Fred B. Seely and Newton E. Ensign. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 486 pp., diagrams, 9 x 6 in., cloth. $4.00.

The aim in this book has been to make the principles of mechanics stand out clearly, to build them up as much as possible from common experience, to apply the principles to concrete problems of practical value, and to emphasize the physical rather than the mathematical interpretation of them. Statics, kinematics, and kinetics are included, the two latter being developed with regard for the increasing importance of dynamics to engineers. The treatment of kinetics has been restricted to the more common types of motion found in engineering practice, but these motions have been treated more fully than is usual in elementary texts.

MECHANICS.

By James E. Boyd. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 417 pp., diagrams, 9 x 6 in., cloth. $3.50.

Intended to give a working knowledge of the principles of mechanics and to supply a foundation on which intelligent study of the strength of materials, stresses in structures, machine design, and other more technical courses may rest. In the development of the subject, emphasis is put on the physical character of the ideas expressed.

GENERAL PHYSICS.

By Ervin S. Ferry. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 732 pp., illus., 8 x 5 in., cloth. $4.00.

This book is designed for those students who require a co-ordinated elementary course in the fundamental principles, the methods and the industrial applications of physics in the early part of their college career. The laws selected for inclusion in the text are those that occur frequently in the ordinary affairs of life and those widely applied in the arts. Hypotheses still in controversy are omitted, and only simple mathematics is used.

LESSONS IN LETTERING: BOOK 1.

By Thomas E. French and William T. Trumbull. 40 pp., 6 x 9 in., illus., paper. $.35.

The first volume of this series is devoted to the letter commercially known as Gothic, and widely used by engineering draftsmen. A series of graded exercises is given.

WITHIN THE ATOM.

By John Mills. N. Y., D. Van Nostrand Co., 1921. 215 pp., illus., 8 x 5 in., cloth. $2.00.

This volume is intended for readers who wish to obtain a familiarity with the basis of modern physical science. Without mathematical formulation it deals with modern theories as to matter and energy, emphasizing the granular structure and electrical nature of matter, and the apparently corpuscular character of energy. The reader need have no previous knowledge of electricity, mechanics, or chemistry.

THE CHEMIST'S HANDBOOK.

By International Correspondence Schools. Second Edition. Scranton, Pa., International Textbook Co., 1921. 348 pp., illus., 5 x 4 in., cloth. $1.00.

A reference book, small enough for the pocket, containing the rules, tables, and methods most generally needed in works laboratories.

AMERICAN SULPHURIC ACID PRACTICE.

By Philip De Wolf and E. L. Larison. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 270 pp., illus., 9 x 6 in., cloth. $3.50.

The authors of this volume have provided a book which without attempting in any way to cover the subject with the thoroughness of Lunge's classic work, will meet the needs of the man with little preliminary knowledge, who wishes an account of the practical essentials of modern American acid making. Both chamber and contact processes are described.

INDUSTRIAL AND POWER ALCOHOL.

By R. C. Farmer. (Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 110 pp., diagrams, 6 x 4 in., cloth. 85 cents.

This is a brief, non-technical account of the important uses of alcohol, other than as a beverage, suited to the needs of engineers requiring a handy survey of the subject.

COMMERCIAL COMMODITIES.

By Frank Matthews. Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 319 pp., illus., 9 x 6 in., cloth. $4.00.

The purpose of this book is to give a not too detailed idea of the important raw or semi-manufactured articles used in trade. A wide variety of materials is described, including the mineral and metallurgical products, foodstuffs, drugs, textiles, oils and fats, plant juices, etc.

THE PSYCHOLOGY OF INDUSTRY.

By James Drever. N. Y., E. P. Dutton & Co. [1921]. 148 pp., 8 x 5 in., cloth. $2.50.

Dr. Drever discusses such topics as the intelligence and vocational fitness of the worker, scientific mental engineering, the factors determining efficiency of work, fatigue, economy of movement, advertising, and salesmanship. On these and similar matters he sets forth what has been done by the psychologist, in language understandable by the ordinary man. A special effort is made to adhere to the psychological point of view and to emphasize principles rather than details of results.

TIME STUDY AND JOB ANALYSIS.

By William O. Lichtner. N. Y., Ronald Press Co., 1921. 397 pp., illus., 9 x 6 in., cloth. $6.00.

The author attempts to explain the practical application of these methods in simple, non-technical terms, as might be done in a series of conferences with an executive charged with the responsibility of decision. The book first presents a general review of the principles of job standardization and their application to time study and job analysis. The organization of a staff to carry out the work is then described in detail. This is followed by a detailed description of the technique of the subject, and the book closes with a consideration of the relation of job standardization to industrial problems.

MODERN BUILDING SUPERINTENDENCE AND THE WRITING OF SPECIFICATIONS.

By David B. Emerson. N. Y., Charles Scribner's Sons, 1921. 247 pp., 7 x 4 in., cloth. $1.75.

This volume is intended to aid the young engineer in superintending construction and in writing building specifications. The author outlines, step by step, the duties of the superintendent during the erection of a typical modern twenty-story office building, calling attention to the matters that must be watched. In similar fashion, he outlines the proper procedure in writing specifications for a small dwelling.

REINFORCED CONCRETE CONSTRUCTION; PART 2.

By M. T. Cantell. Second Edition. Lond., E. & F. N. Spon, Ltd., 1921. 298 pp., illus., diagrams, 9 x 6 in., cloth. 16 s.

A continuation of Part 1, published in 1918, giving new formulas, with their construction and examples of their use. These examples are worked out fully and include the necessary information for designing all types of structures for which reinforced concrete is generally used. Among these are columns, walls, piles, retaining walls, stairs, roofs, strong rooms, water tanks and towers, reservoirs, swimming baths, bins, water mains, sewers, chimneys, etc.

ECONOMIC ASPECTS OF THE GREAT LAKES—ST. LAWRENCE SHIP CHANNEL.

By Roy S. MacElwee, Alfred H. Ritter. N. Y., The Ronald Press Co., 1921. 291 pp., maps, tab., 9 x 6 in., cloth. $4.00.

This work is a study of the local and national advantages to be gained from opening the Great Lakes to ocean traffic. It attempts to co-ordinate the information on the commercial and economic aspects of the proposed ship channel, as presented at the hearings held throughout the country by the International Joint Commission and to present the vital facts affecting the advisability of the construction of the proposed improvement.

DONATIONS TO THE READING ROOM

HANDBOOK OF NATIONAL STEEL LUMBER;

Produced by the National Steel Lumber Co. Prepared by the Steel Lumber Division, under the Direction of H. M. Naugle and Stanley Macomber, Assoc. M. Am. Soc. C. E. Second Edition. Massillon, Ohio, The National Pressed Steel Co., copyright 1921. 183 pp., diagrams, tab., 6⅝ x 4 in., cloth. (Gift of Stanley Macomber, Assoc. M. Am. Soc. C. E.)

The information presented in this Handbook is intended as an aid to the architect and engineer, in the economical design of buildings by the use of National Steel Lumber. In this, the second edition, is embodied complete information and authentic data pertaining to the use of steel lumber sections and kindred materials. The subject-matter covers all recent developments, amplifying in many respects the contents of the first edition. Considerable space is devoted to the discussion of costs of construction, particular attention being given to conditions that affect the total costs of the structural part of a building.

TESTS ON RAILWAY BRIDGES IN RESPECT OF IMPACT EFFECT:

Report of a Sub-Committee to the Advisory Committee for the Revision of the Board of Trade Requirements, 1914, in Regard to the Opening of Railways, Ministry of Transport. Lond., H. M. Stationery Office, 1921. 10 pp., 16 pl., 13¼ x 8¼ in., boards. 15 s. (Gift of Ministry of Transport.)

This report gives the results of tests of impact effect carried out on certain railway bridges. The bridges selected were of steel and, as far as possible, typical of British practice. In carrying out the tests, the intention was to ascertain, if possible, whether a formula could be recommended provisionally for practical purposes, which would provide for all normal increases to stresses, due to the live load.

MEMBERSHIP

(From October 5th to November 1st, 1921)

ADDITIONS

HONORARY MEMBERS

		Date of Membership.
CARSON, HOWARD ADAMS. 79 Glenwood St., Malden, Mass.	M.	Feb. 7, 1894
	Hon. M.	Oct. 10, 1921

MEMBERS

ALBRIGHT, PORTER HUGH. Cons. Engr., 1130 Central Bldg., Los Angeles, Cal.	Assoc. M.	Dec. 3, 1913
	M.	Oct. 12, 1921
BARTHOLOMEW, HARLAND. Engr., City Plan Comm., 712 Compton Bldg., St. Louis, Mo.	Assoc. M.	Oct. 14, 1919
	M.	Oct. 12, 1921
BIGELOW, WILLIAM WALTER. In Chg., Cost Estimating Dept., Lockwood, Greene & Co., 8 Irvington St., Boston, Mass.	Jun.	Feb. 1, 1910
	Assoc. M.	Dec. 3, 1913
	M.	Oct. 12, 1921
BOES, FRANK CHARLES. Acting Sales Mgr., Bancroft-Jones Corporation, Buffalo (Res., 1 Linden Ave., East Aurora), N. Y.	Assoc. M.	Mar. 4, 1913
	M.	April 26, 1921
CROASDALE, EARL FENNER. Constr. and Maintenance Eng., Klots Throwing Co., 235 West 76th St., New York City.		Sept. 12, 1921
DE SCHAUENSEE, FRANCIS. With J. A. L. Waddell (Res., 259 West 75th St.), New York City.		Oct. 10, 1921
ELLETT, TAZEWELL. Engr. of Surveys, Plans, and Estimates, Virginia State Highway Comm., 1003 Grove Ave., Richmond, Va.	Assoc. M.	Oct. 7, 1914
	M.	Sept. 12, 1921
FELLHEIMER, ALFRED. Archt., 7 East 42d St., New York City.		Oct. 10, 1921
FISHER, CHARLES THURSTON. Highway Engr., Morgan Eng. Co., 666 Clinton Pl., Memphis, Tenn.		Oct. 10, 1921
FORD, ARTHUR JENKINS. Gen. Contr. (Morgan-Ford & Co.), 218 O'Neill Bldg., Phœnix, Ariz.	Assoc. M.	Jan. 13, 1919
	M.	Oct. 12, 1921
FREEMAN, ARTHUR CLARICO, JR. Dist. Plant Engr., U. S. Shipping Board, Emergency Fleet Corporation, 70th Ave.-12th St., Oak Lane, Philadelphia, Pa.		Sept. 12, 1921
GAUGER, PAUL CHARLES. Contr. Engr. (Gauger-Korsmo Constr. Co.), 301 Endicott Bldg. (Res., 945 Osceola Ave.), St. Paul, Minn.	Assoc. M.	April 16, 1918
	M.	Oct. 12, 1921
GRISWOLD, LYMAN. Cons. Engr., 506 Railway Exchange Bldg., Portland, Ore.		Oct. 10, 1921
HARDY, FRANCIS HATHAWAY. Chf. of Section, Field Work, U. S. Coast and Geodetic Survey, Washington, D. C.		Oct. 10, 1921
HART, RICHARD AMBROSE. Senior Drainage Engr., U. S. Dept. of Agriculture, 319 Federal Bldg., Salt Lake City, Utah.	Assoc. M.	Dec. 3, 1913
	M.	Oct. 12, 1921
HOLMES, ROBERT LESLIE. Engr., Water Supply, T. & P. Ry., 302 South Rosemont St., Dallas, Tex.	Jun.	Oct. 1, 1907
	Assoc. M.	Feb. 6, 1912
	M.	Oct. 12, 1921
HOUK, IVAN EDGAR. Asst. Engr., Miami Conservancy Dist., Dayton, Ohio.	Assoc. M.	Mar. 14, 1916
	M.	Oct. 12, 1921
HOYT, RAYMOND DUDLEY. Gen. Mgr., Warren Constr. Co., 483 Thompson St., Portland, Ore.		Oct. 10, 1921

MEMBERS (*Continued*)

		Date of Membership.
KELLY, JOHN PATRICK. Asst. to Chf. Engr., Donner Steel Co., 109 Newman Pl., Buffalo, N. Y.		April 25, 1921
LASS, CHARLES ABRAHAM. Gas Engr., Birmingham Ry., Light & Power Co. (Res., 1815 Ave. I South), Birmingham, Ala.	Assoc. M. M.	Nov. 26, 1918 Oct. 12, 1921
LEAHY, THOMAS EMMET. Superv. Engr., Constr. Service, Q. M. C., U. S. A., Care, Const. Q. M. Frankfort Arsenal, Philadelphia, Pa.		Sept. 12, 1921
LONEY, NEIL MCINTYRE. Vice-Pres., Thompson-Starrett Co., 51 Wall St., New York City.		Oct. 10, 1921
MACOMBER, STANLEY. Care, The Central Steel Co., Massillon, Ohio.	Assoc. M. M.	Mar. 4, 1913 Oct. 12, 1921
MCCRONE, ROSSITER MAGERS. Divisional Engr., Royal Irrig. Dept., Box 66, Bangkok, Siam.	Assoc. M. M.	Aug. 31, 1915 July 11, 1921
MCLEOD, PETER ALEXANDER. Asst. Engr., St. L.-S. F. Ry., 812 Providence Ave., Webster Groves, Mo.		Oct. 10, 1921
MANN, CARROLL LAMB. Prof. of Civ. Eng., North Carolina State Coll. of Agriculture and Eng., State College Station, Raleigh, N. C.		June 6, 1921
MILLER, ROY EVERETT. Gen. Mgr., Puget Sound Bridge & Dredging Co., 811 Central Bldg., Seattle, Wash.	Assoc. M. M.	May 31, 1916 Oct. 12, 1921
OTTO, OLAF. Engr. and Contr., 301 Savannah Bank & Trust Bldg., Savannah, Ga.	Assoc. M. M.	June 16, 1919 Oct. 12, 1921
PATTON, RAYMOND STANTON. Chf., Div. of Charts, U. S. Coast and Geodetic Survey, 3920 McKinley St., N. W., Washington, D. C.		July 11, 1921
PECK, CLAIR LEVERETT. Gen. Contr. (Leonardt & Peck), 721 H. W. Hellman Bldg., Los Angeles, Cal.		Oct. 10, 1921
PUTNAM, WALTER. Office and Designing Engr., Edward L. Maybery, 155 North Catalina Ave., Pasadena, Cal.		Oct. 10, 1921
RICHARDSON, CHARLES GERMANE. Engr. and Sales Mgr., Meter Dept., Builders Iron Foundry, 49 Belair Ave., Providence, R. I.		Oct. 10, 1921
RUDOLPH, WILLIAM EDWARD. Structural Engr., H. K. Ferguson Co., Fort Madison, Iowa.	Jun. Assoc. M. M.	Oct. 1, 1912 Sept. 11, 1917 Oct. 12, 1921
SANDSTON, LEONARD MARK. Cons. Engr., 33 Worcester St., Christchurch, New Zealand.	Assoc. M. M.	May 31, 1916 July 11, 1921
SCRIMSHAW, JAMES FREDERICK. Vice-Pres. and Chf. Engr., Salmond, Scrimshaw & Co., 526 Elm St. (Res., 837 Kearny Ave.), Arlington, N. J.	Assoc. M. M.	Jan. 8, 1908 Oct. 12, 1921
SIMONS, PERRY THOMAS. Senior Drainage Engr., U. S. Dept. of Agriculture, Bureau of Public Roads, Washington, D. C.		Oct. 10, 1921
SMYTH, RAPHAEL JOSEPH. Asst. Engr. with Pres. of Borough of the Bronx, 240 East Tremont Ave., New York City.		Oct. 10, 1921
SPOONER, CHARLES WILLETT. Cons. Engr., Powers Theatre Bldg., Grand Rapids, Mich.	Jun. Assoc. M. M.	Mar. 2, 1909 Sept. 3, 1912 Oct. 12, 1921

MEMBERS (*Continued*)

	Date of Membership.
STANDER, ISAAC JOSHUA. Contr. Engr.; Secy. and Treas., I. J. Stander, 118 East 28th St., New York City	Oct. 10, 1921
STEEVES, CLARENCE MCNAUGHTON. (D. C. Burpee & Son), Edmundston, N. B., Canada	Assoc. M. Dec. 31, 1913 M. Oct. 12, 1921
TABOR, HUGH BURDETTE. Gen. Representative, U. S. Steel Products Co., 544 Bartolomé Mitre, Buenos Aires, Argentine Republic.	Sept. 12, 1921
WESTFALL, CURTIS CORNELIUS. Engr. of Bridges, Ill. Cent. R. R., Room 1000, Ill. Cent. Station, Chicago, Ill	Sept. 12, 1921

ASSOCIATE MEMBERS

BALL, JULIAN NORMAN. Secy.-Director, Allied Contractors, Inc., 404 Peters Trust Bldg., Omaha, Nebr	Oct. 10, 1921
BLANCO Y DE CASTRO, CARLOS MARIA. Ingeniero Prin., Ferrocarril Nacionales de Mexico G Anexos, 122 Victoria St., Saltillo, Coah., Mexico	Sept. 12, 1921
BROWN, JONATHAN BURDETTE. Asst. State Engr., 1531 Thirty-eighth St., Sacramento, Cal	Sept. 12, 1921
BUTLER, THOMAS JAMES. Engr. and Surv. (T. J. Butler & Co.), Care, American Consulate, Barranquilla, Colombia	Sept. 12, 1921
CAREY, JOSEPH PHILLIP. County Engr., Quitman County, Marks, Miss	Oct. 10, 1921
CHRISTIE, WARD PHELPS. Research Engr., The Associated General Contractors of America, Inc., 1038 Munsey Bldg., Washington, D. C	April 25, 1921
CLARK, DAVID. Trinity Coll., Dublin, Ireland	Sept. 12, 1921
CORDDRY, WILLIAM HOWARD. Dist. Mgr., Gannett, Seelye, & Fleming, Inc., 262 Randolph Bldg., Memphis, Tenn	Oct. 10, 1921
CRONYN, THEODORE. Plandome, N. Y	Oct. 10, 1921
DANIELS, HARRY T. Care, The Grasselli Chemical Co., 1400 Guardian Bldg., Cleveland, Ohio	June 6, 1921
DORMER, JOHN ALOYSIUS. Asst. Engr. and Supt. of Constr., Fegles Constr. Co., Ltd., 706 First Ave, North, Minneapolis, Minn.	Sept. 12, 1921
ENDLICH, PHILIP JACOB. Superv. Engr., Drafting Room, Lockwood, Greene & Co., 4870 Fernwood Ave., Detroit, Mich	Oct. 10, 1921
FLECK, AUGUSTUS BERNARD. 17 West 42d St., Room 535, New York City	Oct. 10, 1921
GAYTON, LORAN DE LANCY. Asst. Engr., Water-Works Design, City of Chicago, 402 City Hall, Chicago, Ill	April 25, 1921
GILARDI, ADRIAN JOHN. Mass. Inst. Tech., Box 223, Cambridge, Mass.	Oct. 10, 1921
GREEN, JAMES RAYMOND. Supt. of Constr., Pittsburgh-Des Moines Steel Co., 730 Berkshire Ave., South Hills Branch, Pittsburgh, Pa.	Oct. 10, 1921
HARR, GILBERT RAYMOND. Office Engr., Indiana State Highway Comm., 4132 Graceland Ave., Indianapolis, Ind	Sept. 12, 1921
HART, WILLIAM FREDERIC. Highway Engr., U. S. Dept. of Agriculture, Bureau of Public Roads, 414 Funke Bldg., Lincoln, Nebr.	June 6, 1921
HEAGLER, ARTHUR ELLIS. (W. R. Heagler & Sons), Paragould, Ark.	Sept. 12, 1921

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
HERSHMAN, CHARLES LEONARD. Min. Engr., McIntyre Porcupine Mines, Ltd., Box 169, Schumacher, Ont., Canada	June 6, 1921
HOGG, WILLIAM THOMAS. Chf. Draftsman, Eng. Dept., Board of Commrs., Port of New Orleans, 841 Exposition Boulevard, New Orleans, La. (Jun.)	Nov. 4, 1914
(Assoc. M.)	Sept. 12, 1921
HOWE, GEORGE EDWIN. Asst. Engr., Am. Bridge Co., 9 Norwich Ave., Jamaica, N. Y.	Oct. 10, 1921
LELAND, FRANKLIN EDWARD. Res. Engr., Fay, Spofford & Thorndike, 15 Beacon St., 8th Floor, Boston, Mass.	June 6, 1921
LOVING, MORRIS WOOTEN. Asst. Div. Engr., Promotion Bureau, Universal Portland Cement Co., 1441 Greenleaf Ave., Chicago, Ill.	Oct. 10, 1921
MCLAUCHLAN, WALLACE HOWE. 915 East Ocean Boulevard, Long Beach, Cal.	July 11, 1921
MAURER, WARD BYRON. 4512-C Arsenal St., St. Louis, Mo.	Sept. 12, 1921
MITCHELL, EDMUND IRVING. 2204 Clarendon Rd., Brooklyn, N. Y.	June 6, 1921
MUNROE, THOMAS BRANDON. City Engr., Cedartown, Ga.	Oct. 10, 1921
MURPHY, ELMO NEIL. Res. Engr., Pacific Gas & Elec. Co., Cassel, Cal.	Sept. 12, 1921
PACE, RAGSDALE. Engr. and Contr. (B. F. & C. M. Davis Co.), 407 Reynolds Bldg., Fort Worth, Tex. (Jun.)	Nov. 25, 1919
(Assoc. M.)	Oct. 10, 1921
RINEHART, GERALD STAATS. Care, Obras Publicas, San Pedro de Macoris, Dominican Republic	Sept. 12, 1921
ROUNDS, GARLAND LIVINGSTONE. Secy.-Treas., Mayne Eng. Co., 207 Pearl St., Council Bluffs, Iowa	June 6, 1921
RUSSELL, GEORGE HENRY. Civ., Hydr., and Irrig. Engr., County Engr., Lamar, Colo.	April 25, 1921
SHAW, CHARLES. Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C.	Sept. 12, 1921
SHEPARD, SHELDON BEARDSLEY. Constr. Engr., Office of County Engr., St. Louis County, 2229 East 1st St., Duluth, Minn.	Oct. 10, 1921
SHUPTRINE, HARRY AUGUSTUS. Bridge Engr., Board of County Road Commrs., Wayne County, 5035 Oregon Ave., Detroit, Mich.	Oct. 10, 1921
SMEDBERG, CARL WALDEMAR. Asst. Engr., Carolina Eng. Co., Wilmington, N. C.	Oct. 10, 1921
SMITH, RALPH JEROME. Asst. Engr., Eastman Kodak Co., 69 Adams St., Rochester, N. Y.	Oct. 10, 1921
STEINER, CLARENCE. Civ. Engr. and Surv., 473 Broadway, Bayonne, N. J.	July 11, 1921
STOCK, ROLAND HENRY. Capt., Corps of Engrs., U. S. A., 3d Engrs., Schofield Barracks, Honolulu, Hawaii	June 6, 1921
TRAINOR, LEE SMITH. Service Engr., Portland Cement Assoc., 111 West Washington St., Chicago (Res., 160 Clinmar Pl., Centralia), Ill.	April 25, 1921
VAN PETTEN, OLIVER WILLIAM. Supt., Pennagrade Oil & Gas Co., Langley, Ky.	Oct. 10, 1921
WEBER, WALTER RAYMOND. Engr., The Colorado Builders Supply Co., 1534 Blake St., Denver, Colo. (Jun.)	May 15, 1917
(Assoc. M.)	Oct. 10, 1921

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
WILLIAMS, GEORGE WALTER GARNHAM. Care, Water Engr.'s Office, Old Court House, Durban, Natal, South Africa	April 25, 1921

JUNIORS

BOYLE, CORNELIUS ALFRED. 534 Trinity Ave., New York City	Oct. 10, 1921
CHRISTOPHER, BENJAMIN HARRISON, JR. 110 West 183d St., New York City	April 25, 1921
FISHER, LINDEN VAN HORN. Bridge Dept., State Highway Comm., Raleigh, N. C	Oct. 10, 1921
GANDHI, PARSAM MULCHAND. Asst. Engr., Andhra Val. Hydro-Elec. Co., P. O. Thokarwadi, Poona, India	July 11, 1921
GOLDMAN, SAMUEL ROBERT. Bridgewater, N. C	Oct. 10, 1921
GRASHEIM, WALTER EDMUND. 560 West 148th St., New York City	Oct. 10, 1921
HASKELL, LLEWELLYN GILMORE. Civ. Engr., Standard Oil Co., San Francisco (Res., 2947 Elmwood Court, Berkeley), Cal.	Oct. 10, 1921
HAWLEY, JOHN BLACKSTOCK, JR. 912 College Ave., Fort Worth, Tex.	Oct. 10, 1921
JAQUETH, HERBERT HARTWELL. 501 Third Ave., East, Kalispell, Mont.	June 6, 1921
PERRIN, PAYSON AUSTIN. Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, 25 Hadwen Lane, Worcester, Mass.	April 25, 1921
RIGG, BENJAMIN HAINES. Junior Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Juneau, Alaska	Sept. 12, 1921
RONEY, JAMES GIVENS. Asst. Engr., T. & P. Ry., Marshall, Tex	July 11, 1921
SCACCIAFERRO, SALVATOR JOHN. Draftsman, Alexander Potter, 506 Highland Ave., Clifton, N. J	Oct. 10, 1921
SWANHOLM, KEITH HENRY. 1703 North 9th St., Boise, Idaho	Oct. 10, 1921
VICKER, HAROLD ARTHUR. Transitman, Scranton Gas & Water Co., 805 Marion St., Scranton, Pa	Sept. 12, 1921
WAITE, GUY BENNETT, JR. 2 St. Nicholas Pl., New York City	Oct. 10, 1921
WATSON, LESLIE JAMES. Asst. to Chf. Engr., Maui Agricultural Co., Haiku, Maui, Hawaii	July 11, 1921

REINSTATEMENTS

MEMBERS

	Date of Reinstatement.
BACHERT, AUGUSTUS ELLSWORTH	Oct. 10, 1921
BULL, GEORGE MAIRS	Oct. 10, 1921
LATIMER, HUGH	Oct. 10, 1921

ASSOCIATE MEMBERS

TOMLINSON, WILLIAM SIDNEY	Oct. 10, 1921

RESIGNATIONS

ASSOCIATE MEMBERS

	Date of Resignation.
COLLINS, JOHN LAMBERT	Oct. 10, 1921
DAVIS, GILBERT LOUIS	Oct. 10, 1921
GEHRING, HERBERT AUGUST	Oct. 10, 1921
RITTENHOUSE, HARVEY	Oct. 10, 1921

DEATHS

CAPPELEN, FREDERICK WILLIAM. Elected Member, April 3d, 1895; died October, 1921.

FORTER, SAMUEL ALEXANDER. Elected Associate Member, October 1st, 1912; died August 3d, 1921.

GUDMUNDSSON, GISLI. Elected Associate Member, January 3d, 1900; died July 19th, 1921.

KENNEDY, *Sir* JOHN. Elected Member, September 1st, 1875; died October 25th, 1921.

MILLS, HIRAM FRANCIS. Elected Honorary Member, November 30th, 1909; died October 4th, 1921.

ROSS, ANDREW FRANCIS. Elected Associate Member, June 11th, 1917; died May 8th, 1921.

SNYDER, GEORGE DUNCAN. Elected Associate Member, November 6th, 1895; Member, September 4th, 1901; died October 21st, 1921.

Total Membership of the Society, November 1st, 1921, 10 274.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(October 1st, to October 29th, 1921)

NOTE.—*This list is published for the purpose of placing before the members of this Society the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list.

(2) *Journal,* Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal,* Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal,* Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Journal,* Eng. Inst. of Canada, Montreal, Que., Canada.
(6) *Journal,* Am. Inst. of Archts., Washington, D. C., 50c.
(7) *Gesundheits Ingenieur,* Munich, Germany.
(8) *Stevens Indicator,* Hoboken, N. J., 50c.
(9) *Industrial Management,* New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News-Record,* New York City, 25c.
(15) *Railway Age,* New York City, 15c.
(16) *Engineering and Mining Journal,* New York City, 15c.
(17) *Electric Railway Journal,* New York City, 10c.
(18) *Railway Review,* Chicago, Ill., 15c.
(20) *Iron Age,* New York City, 20c.
(21) *Railway Engineer,* London, England, 1s 2d.
(22) *Iron and Coal Trades Review,* London, England, 6d.
(24) *American Gas Journal,* New York City, 10c.
(25) *Railway Mechanical Engineer,* New York City, 20c.
(26) *Electrical Review,* London, England, 4d.
(27) *Electrical World,* New York City, 10c.
(28) *Journal,* New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal,* Royal Soc. of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique,* Brussels, Belgium.
(31) *Annales* de l'Assoc. des Ingenieurs Sortis des Ecoles Speciales de Gand. Brussels, Belgium.
(32) *Memoires et Compte Rendu des Travaux,* Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil,* Paris, France, 1 fr.
(36) *Cornell Civil Engineer,* Ithaca, N. Y.
(40) *Zentralblatt der Bauverwaltung,* Berlin, Germany, 60 pfd.
(41) *Elektrotechnische Zeitschrift,* Berlin, Germany.
(42) *Journal,* Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chausées,* Paris, France.
(45) *Coal Age,* New York City, 15c.
(46) *Scientific American,* New York City, 35c.
(47) *Mechanical Engineer,* Manchester, England, 3d.
(48) *Zeitschrift,* Verein Deutscher Ingenieure, Berlin, Germany.
(49) *Zeitschrift für Bauwesen,* Berlin, Germany.
(50) *Stahl und Eisen,* Düsseldorf, Germany.
(53) *Zeitschrift,* Oesterreichischer, Ingenieur und Architekten-Verein, Vienna, Austria, 70h.
(54) *Transactions,* Am. Soc. C. E., New York City, $16.
(55) *Mechanical Engineering:* Journal, Am. Soc. M. E., New York City, 35c.
(56) *Transactions,* Am. Inst. Min. and Metallurgical Engrs., New York City, $6.
(57) *Colliery Guardian,* London, England, 5d.
(58) *Proceedings,* Engrs.' Soc. of W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings,* American Water Works Assoc., Troy, N. Y.
(60) *Municipal and County Engineering,* Indianapolis, Ind., 25c.
(61) *Proceedings,* Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Forging and Heat Treating,* Thaw Bldg., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings,* Inst. C. E., London, England.
(64) *Power,* New York City, 10c.
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LIST OF ARTICLES

Bridges.

Standard Concrete Highway Bridges and Culverts.* A. C. Irwin. (121) Vol. 17.
The Proposed Hudson River Bridge at New York.* (12) Sept. 23.
Rebuilding Long Trestle Under Traffic.* (87) Oct.
Vibration of Railway Bridges. (21) Oct.
New Cantilever Bridge Begun on the Ohio River.* (13) Oct. 13.
Putting Large Bascule in Service.* (13) Oct. 13.
Results of Impact Tests on Bridges in England.* (13) Oct. 20.
Two Interesting Concrete Bridges in Oregon. (86) Oct. 26.
Some Aspects of Bridge Architecture.* Gustav Lindenthal. (46) Nov.
Le Pont en Béton de Scories de Reading (Pennsylvanie, E.-U.)* (Slag Concrete Bridge at Reading (Pennsylvania, U. S. A.).) (33) Sept. 3.
Die Hängebrücke über den Rio Sapcahy nebst einigen allgemeinen Bemerkungen über die Durchbiegung von Hängebrücken.* (The Suspension Bridge Over the Sapcahy River, with Some General Remarks on the Sagging of Suspension Bridges.) A. Müllenhoff. (69) Mar. 23, 1920.
Die erstmalige Anwendung der Roth-Waagner-Brücke.* (The First Use of the Roth-Waagner Bridge.) R. Feindler. (69) Apr. 23, 1920.
Die Wiederherstellung der Brücke über den Narew bei Modlin durch die Maschinenfabrik Augsburg-Nürmberg, Werk Gustavsburg.* (The Restoration of the Bridge Over the Narew at Modlin, by the Augsburg-Nürnberg Machine Works, Gustavsburg Plant.) (69) May 4, 1920.
Eiserne Brücken und Baukunst. (Iron Bridges and Architecture.) Ehrlich. (69) May 18, 1920.
Beitrag zur Berechnung der Knickfestigkeit der Gurtung offener Brücken.* (Contribution to the Calculation of the Security Against Buckling of the Chords of Open Bridges.) Chr. Vlachos. (69) June 4, 1920.
Das Vergiessen der Auflagersteine der Mittelpfeiler der Berliner Brücke in Halle (Saale).* (Pouring the Supports for the Center Piers of the Berlin Bridge at Halle (Saale).) Karl Mentzel. (69) July 16, 1920.
Der Bau der Brücke über die Dubissa bei Lidoviani durch die Maschinenfabrik Augsburg-Nürnberg A.-G., Werk Gustavsburg.* (Construction of the Bridge Over the Dubissa at Lidoviani by the Gustavsberg Works, Maschinenfabrik Augsburg-Nürnburg, A.-G.) (69) Aug. 10, 1920.
Die Koksverladebrücke des Städtischen Gaswerkes Düsseldorf.* (The Coke-Loading Bridge in the Düsseldorf Municipal Gas Works.) (69) Sept. 3, 1920.
Die Wiederherstellung der Brücke über die Schelde bei Termonde durch die Maschinenfabrik Augsburg-Nürnberg A.-G., Werk Gustavsburg.* (Restoration of the Bridge Over the Schelde at Termonde by the Gustavsburg Works, Maschinenfabrik, Augsburg-Nürnberg A.-G.) (69) Oct. 12, 1920.
Die deutschen Kriegsbruckensysteme.* (The German Military Bridge System.) A. Müllenhoff. (69) Oct. 29, 1920.
Fahrbare Verladebrücke von 34,5m Stützweite und 60m Länge.* (Movable Loading Bridge with 34.5m Span and 60m. Long.) Durbeck. (69) Dec., 1920.
Die Wiederherstellung der Brücke über die Wilia bei Janow durch die Maschinenfabrik Augsburg-Nürnberg A.-G., Werk Gustavsburg.* (The Restoration of the Bridge Over the Wilia at Janow by the Gustavsburg Plant of the Augsburg-Nürnberg A.-G. Machine Works.) (69) Dec. 21, 1920.
Einiges über den Umbau der Eisenbahnbrücke über die Mosel bei Koblenz.* (On the Rebuilding of the Railroad Bridge Over the Mosel at Koblenz.) F. Bohny. (69) Jan.

* Illustrated.

Bridges—(Continued).

Der Brückenbau der neuesten Zeit.* (Bridge Construction in Most Recent Times.) A. Müllenhoff. (48) Serial beginning July 30.

Electrical.

Large Electric Units.* Stanley Parker Smith. (Paper read before British Assoc.) (11) Sept. 16; (73) Sept.

The Heaviside Unity and Unit Impulse Functions.* A. Press. (73) Sept. 23.

Some Notes on Large Electric Units.* Stanley Parker Smith. (Abstract of paper read before British Assoc.) (73) Sept. 23.

The Testing of Thermionic Valves.* H. J. Lucas. (73) Sept. 30.

Long Distance Transmission and Tidal Power.* T. F. Wall. (Abstract of paper read before British Assoc.) (73) Sept. 30.

Radiation from Transmission Lines. John R. Carson. (42) Oct.

Theory of Magneto-Mechanical Systems as Applied to Telephone Receivers and Similar Structures.* R. L. Wegel. (42) Oct.

Rates for Electrical Energy and Service.* F. W. C. Bailey. (42) Oct.

Economics and Engineering Features of the Manitoba Power Commission.* J. Rocchette. (5) Oct.

Coal Mine Power Transmission.* W. C. Adams. (4) Oct.

Bearing of Illumination Intensity Upon Efficiency of Visual Operations.* M. Luckiesh and others. (27) Oct. 1.

Locating Faults in Armature Windings—Single-Parallel Windings.* B. A. Briggs. (64) Oct. 4.

Advantages of Underground Electrical-Service Conduits. L. A. Herdt. (96) Oct. 6.

Insulating Materials. W. H. Nuttall. (73) Oct. 14.

The Radio Link.* (46) Nov.

Régulateur-Limiteur d'Intensité, Système Brown-Boveri.* (Brown-Boveri Regulator for Limiting the Intensity (on short circuit).) (33) Sept. 10.

Comparaison du Chauffage au Gaz et a l'Electricité. (Comparison of Gas and Electric Heating.) A. Grebel. (33) Sept. 17.

Appareil Automatique de Télégraphie Privée, Système Télétype. (Automatic Apparatus for Private Telegraph Systems. Teletype System.) (33) Sept. 24.

Die Verwendung der Elektrizität in der Heizungstechnik.* (The Use of Electricity in Heating.) R. Gautschi. (7) Jan. 8.

Das Kilowatt als technische Einheit der Leistung. (The Kilowatt as the Technical Unit of Power.) Max Jakob. (48) Jan. 15.

Stabzahl und Drehmoment von Kurschlussankern.* (Rod Number and Moment of Rotation of Short Circuit Armatures.) W. Stiel. (48) Feb. 5.

Die Elektrizität in der Landwirtschaft.* (Electricity in Farming.) (53) Mar. 4.

Die Radiogrossstation Eilvese.* (The Eilvese Large Radio Station.) Felix Linke. (48) Aug. 20.

Vorläufige Grenzen im Elektromaschinenbau.* (Present Limitations in the Construction of Electric Machinery.) W. Reichel. (48) Aug. 27.

Marine.

Report of Special Committee on Concrete Ships and Barges. (121) Vol. 17.

Some Experiments on Tallows Used for Launching Ships.* J. J. King-Salter. (90) Vol. 63.

Notes on Deflections of Bulkheads and of Ships.* A. M. Robb. (90) Vol. 63.

On the Spacing of Transverse Bulkheads.* K. G. Finlay. (90) Vol. 63.

A Study of the Framing of a Ship.* T. B. Abell. (90) Vol. 63.

The Design of Balanced Rudders of the Spade Type.* M. E. Denny. (90) Vol. 63.

Life-Saving Appliances on Cargo and Passenger Vessels.* E. W. Blocksidge. (90) Vol. 63.

Mechanical Gears, of Double Reduction, for Merchant Ships.* R. J. Walker and S. S. Cook. (90) Vol. 63.

The Strength of Submarine Vessels.* W. R. G. Whiting. (90) Vol. 63.

The Ex-German Battleship *Baden.** S. V. Goodall. (90) Vol. 63.

Notes on Some Features of German Warship Construction. Eustace. T. d'Eyncourt. (90) Vol. 63.

Electric Auxiliaries on Merchant Ships.* E. D. Dickinson. (42) Oct.

Coaling Barge Combines Dragline Bucket and Conveyor.* (13) Oct. 13.

Note sur l'Application de la Résistance des Matériaux à la Construction des Navires en Acier. (Note on the Application of the Strength of Materials to the Construction of Steel Vessels.) Robert Dauwe. (31) Vol. II, Pt. 2.

Les Moteurs Diesel et Semi-Diesel Marins, Système Renault.* (Diesel and Semi-Diesel Marine Engines of the Renault Type.) Ch. Dantin. (33) Sept. 10.

Die Entwicklung des Eisenbetonschiffbaues während des Kriegsjahre.* (Development of Reinforced Concrete Ship During the War Years.) Knud Hojgaard. (78) Serial beginning Oct. 4, 1920.

Drehwerk mit ausfahrbaren Schwimmbühnen für den Bau von Eisenbetonschiffen.* (Turntable with Removable Floating Platforms for the Construction of Ferro-Concrete Ships.) L. Karner. (78) Oct. 4, 1920.

Sechskammerdock.* (Dock with Six Chambers.) von Klitzing. (48) Jan. 8.

Das Motorschiff *Adolph Sommerfeld.** (The Motor Ship *Adolph Sommerfeld.*) (48) Feb. 26.

Neuere Wege im Betonschiffbau.* (New Methods in Concrete Ship Construction.) Leo Kauf. (78) Serial beginning Mar. 7.

Die *Götaälf*, ihr Bau und Stapellauf.* (The *Götaälf*, Its Conctruction and Launching.) Albert Marx. (78) Serial beginning May 4.

* Illustrated.

Mechanical.

A Small Ball-Hardness Testing-Machine.* H. Moore. (75) Vol. 1.
The Mechanical Loading of Ships.* H. J. Smith. (75) Vol. 1.
The Mechanical Qualities Required in Eyebolts with Some Consideration of the Izod Test, in Its Relation to the Question of Brittleness in Mild Steel.* R. T. Rolfe. (75) Vol. 1.
The Manufacture of British Association Screw-Thread Gauges. T. Farrance Davey. (75) Vol. 1.
The Desirability of Standardization in the Testing of Welds.* F. M. Farmer. (75) Vol. 1.
The Generation of Steam.* H. Riall Sankey. (75) Vol. 1.
Degassing and Purification of Boiler Feed-Water.* Paul Kestner. (75) Vol. 1.
Limit Gauging.* Richard T. Glazebrook. (75) Vol. 1.
The Standardization of Data for Airship Calculations.* H. B. Wyn-Evans. (90) Vol. 63.
Notes on the Cleaning of Blast-Furnace Gas.* S. H. Fowles. (71) Vol. 103.
The Scientific Control of Combustion.* H. T. Ringrose. (71) Vol. 103.
Boiler Equipment at River Rouge Plant of the Ford Motor Company.* George T. Ladd (58) Apr.
Some Methods of Obtaining Adjustable Speed with Electrically Driven Mills.* K. A. Pauly. (58) Apr.
An Analysis of the Automatic Ignition Advance Mechanism.* C. H. Hindl. (120) Aug. 18.
Cast-Iron Pipe, the Method of Manufacture and Its Inspection.* William R. Conard. (28) Sept.
Coppée Coke Ovens at Port Talbot.* (57) Sept. 16.
American Pipe Lines for Pumping Oil.* (12) Serial beginning Sept. 16.
The Rotary Piercing Machine for Steel and Copper Billets.* C. E. Davies. (11) Serial beginning Sept. 16.
The Wilputte Regenerative By-Product Coke Oven.* (22) Sept. 23.
Cremation. G. S. Burt-Andrews. (114) Sept. 24.
A New Swiss Magneto of the Inductor Type.* (120) Sept. 29.
The Effect of Mixture Ratio and Temperature on Power and Economy.* C. S. Kegerreis. (120) Sept. 29.
The Froth Flotation of Coal.* Frank Butler Jones. (Abstract of paper read before South Wales Inst. of Engrs.) (22) Sept. 30.
Requirements in the Design of Steam Power Stations for Hydraulic Relay.* E. B. Powell. (55) Oct.
The Rising Importance of Oil-Injection Type of Internal-Combustion Engine.* Charles E. Lucke. (55) Oct.
Design and Construction of the 16-In. Disappearing Carriage from an Engineer's Standpoint.* G. M. Barnes. (55) Oct.
Control of Corrosion in Iron and Steel Pipe.* F. N. Speller. (55) Oct.
Steam Superheaters: Their Design, Construction, Application and Use.* H. B. Oatley. (55) Oct.
Application of the Law of Kinematic Similitude to the Surge-Chamber Problem.* W. F. Durand. (55) Oct.
Concrete Bins and Pits for Coal Storage.* A. C. Irwin. (117) Oct.
Demand Factor of Coal Mining Loads.* Carl Lee. (4) Oct.
Casting and Steaming Reinforced Pipe.* (67) Oct.
Modern Steam Power Station Design.* Frank S. Clark. (3) Oct.
Another Fifteen Million Gas Holder.* (83) Oct. 1.
New Machine Completes Tunnel in One Operation.* (13) Oct. 6.
Reversible Thermal Expansion of Silica. H. S. Houldsworth and J. W. Cobb. (Abstract of paper read before Ceramic Soc.) (28) Oct. 7; (57) Oct. 7.
Thermal Efficiency of Oil-Gas Sets.* E. L. Hall and S. H. Graf. (83) Oct. 8; (24) Oct. 8.
The Fine Art of Lime Burning.* George B. Wood. (Paper read before National Lime Assoc.) (105) Oct. 12.
The Testing of Motor Fuels. (120) Serial beginning Oct. 13.
New Application of Pitot Tube in Testing Pumps.* Arthur L. Collins. (13) Oct. 13.
Studies in Colorado Shale Oils. Arthur J. Franks. (105) Serial beginning Oct. 19.
Hammer-Welding Plant of the Blaw-Knox Co.* Ernest Edgar Thum. (105) Oct. 19.
Suggestions as to the Design of a Tipple to Suit Ordinary Market Conditions of the West.* Benedict Shubart. (45) Oct. 20.
The Application and Manufacture of Silent Chain.* J. Edward Schipper. (120) Oct. 20.
The Design and Application of Atmospheric Burners.* Thomson King. (24) Oct. 22.
Protective Covering for Steel Pipe.* L. M. Klauber. (83) Serial beginning Oct. 22.
Shop-Operations and Repairs on Gold-Dredges. (From *Western Machinery World.*) (103) Oct. 22.
Accounting for Steam Production and Distribution.* A. R. Smith. (64) Oct. 25.
High-Pressure Oil Burning Installation.* (64) Oct. 25.
The Design of Springs.* Joseph Kaye Wood. (72) Oct. 27.
L'Exposition d'Appareils de Controle de la Chauffe à l'Office Central de Chauffe Rationnelle. (Exposition of Apparatus for the Control of Heating at the Central Office for Rational Heating.) (33) Sept. 10.
Comparaison du Chauffage au Gaz et à l'Electricité.* (Comparison of Gas and Electric Heating.) A. Grebel. (33) Sept. 17.
Réchauffage et Production d'Eau d'Alimentation, par la Vapeur d'Echappement de Turbines Auxiliaires.* (Heating and Production of Feed Water from Exhaust Steam from Auxiliary Turbines.) (33) Sept. 17.
L'Emploi du Mazout comme Combustible Industriel. Les Progrès Récents de la Chauffe des Chaudières au Mazout.* (Use of Mazout as an Industrial Fuel. Recent Progress in Heating Boilers with Mazout.) Ch. Dantin. (33) Serial beginning Sept. 24.

* Illustrated.

Mechanical—(Continued).

Moderne Verladeanlagen.* (Modern Unloading Equipment.) Gustav Gratz. (69) Sept. 3, 1920.

Warum springen Schleifscheiben? (Why do Grinding Discs Break?) W. Hanusch. (80) Jan. 6.

Wie enstehen Geräusche in Hauswasserleitungen und wie Konnen sie Vermieden werden? (What Causes Noises in House Water Pipes and How Can They be Prevented?) (7) Jan. 8.

Der Betriebzustand der Gaswerke.* (Operating Condition of Gasworks.) R. Geipert. (48) Jan. 8.

Beiträge zur Berechnung kritischer Torsions-Drehzahlen.* (Contributions to the Calculation of Critical Numbers of Revolution While Under Torsion.) Fr. Sass. (48) Jan. 15.

Brennstoffgewinnung aus den Feuerungsrückständen. (Recovery of Fuel from Furnace Residues.) Winckel. (7) Jan. 15.

Dieselmaschinenfabrik in Glasgow.* (Manufacture of Diesel Engines in Glasgow.) Karl Bernhard. (48) Jan. 22.

Die Dockpumpenanlage im argentinischen Kriegshafen Puerto Militar.* (The Pumping Equipment at the Docks in the Argentine Naval Port, Puerto Militar.) H. Wiegleb. (48) Jan. 22.

Zweckmässige Ventile zur Vermeidung von Wasser- und Wärmeverlusten beim Abschlamm der Dampfkessel. (Suitable Valves for the Prevention of Water and Heat Losses on Cleaning Out a Steam Boiler.) (7) Jan. 29.

Untersuchung selbsttätiger Pumpenventile und ihrer Einwirkung auf den Pumpengang.* (Investigation of Automatic Valves and Their Effect on the Operation of the Pump.) Ludwig Krauss. (48) Jan. 29.

Gesunde und wirtschaftliche Heizung für das Kleinwohnhaus und für die Etagenwohnung.* (Hygienic and Economic Heating for the Small Dwelling House and for the Apartment House.) Heinrich Fries. (7) Jan. 29.

Selbsttätiger Kreiselwipper.* (A Rotary Tipper.) Buhle. (48) Jan. 29.

Das selbsttätige Stillsetzen von Automaten.* (The Automatic Stopping of Automatic Machinery.) Bauer. (48) Jan. 29.

Die Druckluft-Bekohlanlage auf der Zeche Ver Welheim.* (Pneumatic Coal Conveying Installation at the Ver. Welheim Mine.) (48) Feb. 5.

Entladeanlagen für Kesselkohlen.* (Unloading-Plants for Coal for Boiler Heating.) Hubert Hermanns. (7) Feb. 5.

Selbsttätige Regelung der Einblaseluft bei Dieselmaschinen.* (Automatic Regulation of the Air Injector in Diesel Engines.) Max Lindemann. (48) Feb. 5.

Die Bemersung der Kondensleitungen bei Dampfheizungen.* (The Measuring of the Condensing Piping in Steam Heating.) O. Liersch. (7) Feb. 12.

Wärmeerfordernis und Wärmeaufwand. (Heat Requirements and Heat Expenditure.) Otto Ginsberg. (7) Feb. 12.

Sandstrahlgebläse.* (Blowers for Sand Blasts.) Wilhelm Kaempfer. (48) Feb. 12.

Dampfstrahlluftpumpen in Amerika.* (Steam-Jet Air Pumps in America.) K. Hoefer. (48) Feb. 19.

Das spezifische Gewicht der Dampfluftmischungen bei Lufttrocknungsanlagen.* (Specific Weight of Mixtures of Steam and Air in Air Drying Plants.) E. Hausbrand. (7) Mar. 5.

Ueber Ersatzbrennstoffe. (On Fuel Substitutes.) Schilling. (7) Mar. 19.

Anschluss tiefstehender Warmwasserheizkörper.* (Connecting Hot Water Heating Units Below Level.) Otto Liersch. (7) Mar. 19.

Ueber Rostverkleinerungen und Brennstoffesparnisse.* (On Grate Reduction and Fuel Economy.) (7) Mar. 26.

Gliederung und Bezeichnung der Luftfördermaschinen.* (Parts and Names of Pneumatic Conveying Machinery.) M. Berlowitz. (7) Mar. 26.

Trocknungsanlagen für schaufelbares Trockengut.* (Drying Installations for Material That Can Be Shovelled.) Karl Reyscher. (7) Apr. 2.

Einrichtungen zum Berbesserung des Wirkungsgrades von Zentralheizungskesseln.* (Arrangements for Improving the Efficiency of Central Heating Boilers.) Jos. Fichtl. (7) Apr. 3.

Einheitliche Baumaschinen.* (Construction Machines as Separate Units.) Friedrich Merkl. (53) Apr. 8.

Der Elvo-Ofen für Siedlungen und Kleinwohnungen.* (The Elvo Furnace for Small Dwellings and Settlements Formed on Account of the Shortage of Houses.) Fritz Eelbo. (7) Apr. 9.

Die Wärmewirtschaft bei den Zentralheizungsanlagen. (Heat Economy in Central Heating Plants.) (7) Apr. 16.

Neuartige staub- und geruchfreie Grudeheizung.* (New Type of Dust-Free and Smoke-Free Heating with Hot Ashes.) Kropf. (7) Apr. 23.

Brennstoffgewinnung aus den Feuer Ungsrücksständen. (Fuel Recovery from Furnace Residues.) Schilling. (7) Apr. 30.

Elektrisch betriebene Lokomotiv-hebekrane.* (Electrically Driven Locomotive Lifting Crane.) Ernst Schwarz. (48) May 28.

Ueber einige Eigenschaften des Wasserdampfes.* (On Some Properties of Water Vapor.) Max Jakob. (48) May 28.

Fördermaschinen für Flüssigkeiten.* (Conveying Machines for Liquids.) Josef Kautz. (53) Aug. 5.

Eine weitere Anwendung von Schaubildern zur Abgasanalyse.* (A Further Use of Diagrams in Waste Gas Analysis.) K. Kutzner. (48) Aug. 13.

Dampfkesselexplosion im Elektrizitätswerk Abo.* (Steam Boiler Explosion at the Abo Electricity Works.) Max Klein. (48) Aug. 13.

Vakuumdampfheizung.* (Vacuum Steam Heating.) L. Silberberg. (48) Aug. 20.

* Illustrated.

Mechanical—(Continued).

Temperaturmessungen an Kolben von Oelmaschinen.* (Temperature Measurements on the Pistons of Oil Engines.) W. Riehm. (48) Aug. 27.

Geschwindigkeitsregler für Wander-roste.* (Speed Regulator for Moving Grates.) Generlich. (48) Sept. 3.

Messungen über das Rundlaufen und die Spannkraft Selbstzentrierender Dreibackenfutter.* (Measurements on the Rotation and Extensibility of Self-Centering Chucks with Three Jaws.) (48) Sept. 3.

Eine Dampfheizanlage mit festem Warmespeicher in der Spinnerei H. Buhler & Cie., Sennhof.* (A Steam Heating Plant with a Solid Heat Regenerator in a Spinning Mill.) M. Hottinger. (107) Sept. 3.

Die neueren Fortschritte der flugtechnischen Strömungslehre.* (Recent Advances in the Aero-technical Theory of Air Flow.) L. Prandtl. (48) Sept. 10.

Schüttelschwingungen an Schiffen und elektrischen Lokomotiven.* (Oscillatory Vibrations in Boats and Electric Locomotives.) A. Wichert. (48) Sept. 10.

Der neue Kraftwagen von Dr.-Ing. Rumpler.* Dr. Engr. Rumpler's New Power Vehicle.) A. Heller. (48) Sept. 24.

Elektrische Warmwasser-Heizanlagen mit Wärme-Akkumulierung für Schulhäuser. (Electric Hot Water Heating Plants with Heat Accumulators, for School Buildings.) (107) Sept. 24.

Metallurgical.

The Welding of Steel in Relation to the Occurrence of Pipe, Blow-Holes and Segregates in Ingots.* H. Brearley. (71) Vol. 103.

Blast-Furnace and Cupola Slags.* J. E. Fletcher. (71) Vol. 103.

The Prevention of Hardening Cracks and the Effect of Controlling Recalescence in a Tool Steel.* Shipley N. Brayshaw. (71) Vol. 103.

On the Cause of Quenching Cracks.* Kôtarô Houda and others. (71) Vol. 103.

Solid Solution of Oxygen in Iron.* J. E. Stead. (71) Vol. 103.

Roentgen Spectrographic Investigations of Iron and Steel.* Arne Westgren. (71) Vol. 103.

Comparison of Different Methods of Estimating Sulphur in Steel.* T. E. Rooney. (71) Vol. 103.

"Slip-Lines" and Twinning in Electro-Deposited Iron.* W. E. Hughes. (71) Vol. 103.

The Properties of Some Nickel-Aluminum-Copper Alloys.* A. A. Read and R. H. Greaves. (11) Sept. 23.

New American 600-Ton Blast Furnace Plant.* (22) Sept. 30.

The Recovery of Sulphur from Blast-Furnace Slag.* (19) Oct.

The Possibility of Improved Methods of Rolling Sheet Steel. Sumner B. Ely. (55) Oct.

New Ford Foundry Plant at River Rouge.* L. B. Breedlove. (20) Sept. 29.

The Effect of Temperature in Case-Hardening.* Theodore G. Selleck. (From *Transactions* of Am. Soc. for Steel Treating.) (25) Oct.

Studies of Crystal Structure with X-Rays.* Edgar C. Bain. (105) Oct. 5.

The Amorphous Metal Hypothesis.* Zay Jefferies and R. S. Archer. (105) Oct. 12.

Hardness Variations in Heat-Treated Steel. Carle R. Hayward. (105) Oct. 12.

Structural Properties of Metals and Alloys.* R. W. Woodward. (72) Serial beginning Oct. 13.

Crane Operating Costs at Blast Furnaces.* George L. Collord. (20) Oct. 13.

Development of Copper Precipitating Apparatus.* Joseph Irving, Jr. (103) Oct. 15.

Causes of High Top Heat in the Blast Furnace.* Wallace G. Imhoff. (105) Oct. 19.

Cost of Rolling Steel in Blooming Mills.* G. E. Stoltz. (Paper read before Assoc. of Iron and Steel Elec. Engrs.) (20) Oct. 20.

Mixed Orientation Developed in Crystals of Ductile Metals by Plastic Deformation.* Edgar C. Bain and Zay Jeffries. (105) Oct. 26.

Uranium Steels.* Hugh S. Foote. (105) Oct. 26.

Non-Magnetic, Flame-, Acid- and Rust-Resisting Steel.* (105) Oct. 26.

Rolling Pure Nickel.* (46) Nov.

La Fabrication des Tubes sans Soudre por Laminage Oblique, Système Mannesmann.* (Manufacture of Tubes Without Welding, by Oblique Rolling, Mannesmann Process.) F. Couleru. (33) Serial beginning Sept. 10.

Die Fabrikanlage des "Oesterreichischen Vereine für chemische und metallurgische Produktion" in Falkenau a. d. Eger.* (The Factory for the Austrian Society for Chemical and Metallurgical Production in Falkenau on the Eger.) Hugo Szekely. (78) Serial beginning Nov. 4, 1920.

Zur Frage eines wirksamen und wirtschaftlichen Eisenschutzes. (On the Question of an Economic and Efficient Iron Preservative.) Leopold Herzka. (69) Nov. 19, 1920.

Maschinenarbeit hinter dem Hochofen.* (Mechanical Auxiliaries on the Tapping Side of the Blast Furnace.) F. W. Broy. (48) Jan. 15.

Der Siemens-Regenerativ-Gas-Stoss-ofen mit Flammenteilung.* (Siemens Regenerative Gas-fired "Push" Furnace with Distribution of Flames.) Arthur Sprenger. (50) June 2.

Merkurirdige Brucherscheinungen bei Eisenstäben.* (Noteworthy Appearances of Fracture in Iron Bars.) J. Grimme. (48) June 4.

Beitrag zur Härteprüfung.* (Contribution to the Testing of Hardness.) F. Waizenegger. (48) July 30.

Riffelbildung durch Reibschwingungen.* (Fissure Formation by Frictional Vibration.) A. Wichert. (50) Aug. 25.

Fortschritte auf dem Gebeite der Kokserzeugung der Einfluss der Koksbeschaffenheit auf den Hochofenbetrieb und Vorschläge für die Verbesserung des leizteren.* (Progress in the Production of Coke, the Influence of the Quality of Coke on Blast Furnace Operation, and Suggestions for Improving the Latter.) Heinrich Koppers. (50) Serial beginning Aug. 25.

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* Illustrated.

Metallurgical—(Continued).

Ueber ein metallographisches Kennzeichen für die Ermittlung der vorangegangenen Glühbehandlung von weichem Flusseisen.* (On a Metallographic Characteristic for the Determination of the Previous Heat Treatment of Mild Ingot Iron.) P. Oberhoffer. (50) Sept. 1.

Neuere Rüttelformmaschinen.* (Modern Jarring Molding Machines.) U. Lohse. (50) Serial beginning Sept. 1.

Formerei von Auto-Zylinderblöcken.* (Molding Auto-Cylinder Blocks.) Carl Irresberger (50) Serial beginning Sept. 1.

Die magnetischen Eigenschaften von Elektrolyteisen.* (The Magnetic Properties of Electrolytic Iron.) E. Gumlich. (50) Sept. 8.

Ein neues Aetzmittel für Chrom-und Wolframstähle.* (A New Etching Agent for Chrome and Tungsten Steels.) Karl Daeves. (50) Sept. 8.

Ueber den Lusammenhang zwischen physikalischer und chemischer Beschaffenheit des Thomasroheisens.* (On the Connection Between Physical and Chemical Quality of Thomas Pig Iron.) Otto Holz. (50) Sept. 15.

Ein Beitrage zur Frage des Holzfaserbruches im Stahl. (A Contribution on the Question of the Woody Fibrous Fracture in Steel.) J. Hanny. (50) Sept. 15.

Das Entstehen von Spannungen bei der Wärmebehandlung.* (The Appearance of Stresses on Heat Treating.) W. Tafel. (50) Sept. 22.

Technischer Haupausschuss für Giessereiwesen.* (Technical Committee on Foundry Methods.) (50) Sept. 29.

Military.

Die deutschen Kriegsbrückensysteme.* (The German Military Bridge System.) A. Müllenhoff. (69) Oct. 29, 1920.

Eisenbetonbauten im Militärlager Bruck-Királyhida.* (Ferro-Concrete Construction at the Bruck-Kir Military Camp.) Awner Badian. (78) Serial beginning Feb. 4.

Mining.

Experimenting on Air Lift Pumping.* John S. Owens. (Paper read before British Assoc.) (71) Sept. 23.

Hydraulic Stowing.* George Knox and J. Drummond Paton. (Abstract of paper read before South Wales Institute of Engineers.) (22) Sept. 30.

Coal Mine Power Transmission.* W. C. Adams. (4) Oct.

Iron Mining in the Lake Superior District.* J. C. Metcalf. (56) Oct.

Gathering in Coal Mines. R. L. Kingsland. (42) Oct.

Decay of Timber in Return Air Courses.* D. Harrington. (16) Oct. 8.

Gas Mask, Developed by Bureau of Mines, Absorbs Carbon Monoxide from Inspired Air.* Guy H. Burrell. (45) Oct. 20.

Drilling Results and Dredging Returns.* Charles W. Gardner. (16) Serial beginning Oct. 22.

Mechanical and Engineering Considerations Determining the Selection of an Electric Locomotive.* H. H. Johnston. (45) Oct. 27.

La Sixième Série d'Essais sur les Inflammations de Poussières, de la Station des Mines de Liévin.* (The Sixth Series of Tests on the Inflammability of Dusts at the Liévin Testing Station.) R. Robinot Marcy. (33) Sept. 10.

Neuerungen im maschinellen Betriebe von Bergwerksanlagen über Tage. (Innovations in Machine Operation of Mining Plants Above Ground.) Lwowski. (48) Serial beginning Aug. 6.

Die Rohrleitungen im Bergbau.* (Pipe Lines in Mining.) Herman Kratz. (48) Aug. 20.

Kläranlage zur Kohlenschlamm-und Wasserrückgewinnung für die Kohlenwäsche der Firma Gebrüder Stumm, Neunkirchen (Saar).* (Settling Apparatus for Recovering Coal Slime and Water for the Coal Washer of the Stumm Bros. Firm, Neunkirchen (Saar).) Münkner. (78) Mar. 7.

Miscellaneous.

The Protection of Iron with Paint Against Atmospheric Corrosion. J. Newton Friend. (71) Vol. 103.

X-Rays and Their Industrial Applications.* G. W. C. Kaye. (29) Sept. 23.

The Alignment Chart.* C. W. Crockett. (120) Sept. 29.

The Self-Corrosion of Cast Iron and Other Metals in Alkaline Soils.* W. Nelson Smith and J. W. Shipley. (5) Oct.

Time Studies in the Foundry.* A. G. Peter. (9) Oct.

Industrial Training and Selection of Personnel. C. R. Dooley. (105) Oct. 12.

Texas County Tries Lump-Sum-Fee Road Contract.* (13) Oct. 13.

Suspended Impurity in City Air.* J. S. Owens. (Paper read before British Assoc.) (11) Oct. 14.

Accounting for Steam Production and Distribution.* A. R. Smith. (64) Oct. 25.

Accounting Records for Consulting Engineers.* Arthur L. Mullergren. (13) Oct. 27.

Note sur la Représentation des Equations Linéaires par Rapport à Quatre Variables Nomographie).* (Note on the Representation of Linear Equations with Reference to Four Variables (Nomography).) E. Minnaert. (31) Vol. II, Pt. 2.

Einheitliche Formel- und Einheitszeichen.* (Standardized Formulas and Unit Symbols.) (7) Feb. 12.

Municipal.

Housing and Town-Planning Problems in South Africa. D. E. Lloyd-Davies. (88) Sept.

The Land Question as Related to City Planning and Housing. George Herbert Gray. (6) Oct.

Glassware and Posts for Street-Lighting Service.* C. H. Shepherd. (117) Oct.

Some Recent Municipal Works in Southport.* A. E. Jackson. (114) Oct. 8.

* Illustrated.

Railroads.

A Shipper's View of the Evolution of Transportation and Its Effect on Steam Railways. George C. Conn. (61) Sept.
Report No. 4 On the Question of Passenger Carriages. E. Biard. (88) Sept.
Report No. 1 On the Question of Interchange of Rolling Stock. C. W. Crawford. (88) Sept.
Report No. 1 On the Question of the Economic Production and Use of Steam on Locomotives.* Maurice Lacoin. (88) Sept.
Report No. 4 On the Question of the Construction of the Road-Bed and of the Track. K. Ahlberg. (88) Sept.
The Electrification of the Swiss Federal Railways.* (12) Serial beginning Sept. 30.
Some Mechanical Characteristics of High-Speed, High-Power Locomotives. *A. W. Gibbs. (3) Oct.
Characteristics of the Electric Locomotive.* N. W. Storer. (3) Oct.
Automatic Signals on the Queensland Railways.* (21) Oct.
New Three-Cylinder 4–6–0 Type Locomotives, Caledonian Railway.* (21) Oct.
Vibration of Railway Bridges. (21) Oct.
100-Ton Coal Cars for the Chesapeake & Ohio.* (25) Oct.
Expressing Railway Grading Costs by Trend Curves.* Leslie A. von Rosenberg. (15) Oct. 1.
Missouri Pacific Rebuilds Station in Record Time.* E. A. Hadley. (15) Oct. 1.
Railroad Line Change in the Tehachapi Pass.* (13) Oct. 6.
Frisco Secures Maximum Benefit for Modest Outlay.* (15) Oct. 8.
Waterworks System for the Norfolk & Western Ry., at Roanoke, Va.* (18) Oct. 8.
The Locomotive Booster as an Operating Factor.* (18) Oct. 8.
Texas County Tries Lump-Sum-Fee Road Contract.* (13) Oct. 13.
Australian Standard Rail Sections and Specifications.* (13) Oct. 13.
M. K. & T. Improves Its Facilities at Oklahoma City.* (15) Oct. 15.
Electric Motive Power for Paulistra Railway.* (15) Oct. 15.
The Cost of Contract *vs.* Railway Shop Repairs.* (15) Oct. 15.
Expedients for Economizing in Maintenance and Construction of Street Railway Track. R. J. Smith. (Abstract of paper read before Iowa Elec. Ry. Assoc.) (86) Oct. 19.
Advantages of Budget System for Track Work. C. A. Morse. (86) Oct. 19.
Penstock Bursts During Tryouts of High-Head Turbine Plant. (13) Oct. 20.
New Haven Freight Transfer Facilities at Cedar Hill.* (15) Oct. 22.
Report on the Construction and Maintenance of Cinder Pits.* (Am. Ry. Bridge and Building Assoc.) (15) Oct. 22.
Report on Lining Tunnels Under Traffic. (Am. Ry. Bridge and Building Assoc.) (15) Oct. 22.
Report on the Construction and Maintenance of Passenger Platforms. (Am. Ry. Bridge and Building Assoc.) (15) Oct. 22.
Report on the Detection and Repair of Leaks in Water Mains. (15) Oct. 22.
Etude des Chassis de Wagons.* (Design of Truck Chassis.) M. Le Touzé. (38) Sept.
Les Nouveaux Wagons en Acier de 109 Tonnes de Capacité, du Virginian Railway (Etats-Unis). (The New Steel Cars of 109 Tons Capacity on the Virginian Railroad (U. S.).) (33) Sept. 17.
Etude Graphique de l'Accélération d'un Train.* (Graphical Study of the Acceleration of a Train.) P. Caufourier. (33) Sept. 17.
Beitrag zur Berechnung von Schutzbrücken für Drahtseilschwebebahnen.* (Contribution to the Calculation of Protection Bridges for Suspension Cable Railways.) A. Knees. (69) Dec. 3, 1920.
Eisenbahnwagenkasten aus Eisenbeton.* (Railroad Car Bodies of Reinforced Concrete.) Max Gensbaur. (78) Serial beginning Dec. 4, 1920.
Einiges über den Umbau der Eisenbahnbrücke über die Mosel bei Koblenz.* (On the Rebuilding of the Railroad Bridge Over the Mosel at Koblenz.) F. Bohny. (69) Jan.
Eigenartige amerikanische Bahnhofshalle.* (Peculiar American Railway Station Halls.) Hausmann. (69) Jan.
Ueber Verwendung von flusseisernen Lokomotiv-Feuerbüchsen. (On the Use of Ingot Iron Locomotive Fireboxes.) (53) Jan. 21.
Verheerende Wirkung eines Murganges.* (Detrimental Action of Detritus Carried by Water.) Th. Güdel. (78) Feb. 4.
Neue Eisenbahnwagenbauten in Eisenbeton.* (New Railway Car Construction of Reinforced Concrete.) Gerhard Neumann and Franz Lehner. (78) Feb. 4.
Bogenläufige Lokomotiven.* (Locomotives Capable of Taking Curves.) F. Meineke (48) Serial beginning Feb. 19.
Die Fahrzeuge für den elektrischen Betrieb der Berliner Bahnen.* (Rolling Stock for the Electric Operation of the Berlin Railways.) (48) Feb. 12.
Der elektrische Betrieb der Rhätischen Bahn.* (The Electric Operation of the Rhätisch Railroad.) (48) Feb. 26.
Das Hartguss (Griffin) Rad im Eisenbahnbetrieb und seine Herstellung.* (The Chill Cast (Griffin) Wheel in Railroad Operation and Its Manufacture.) (Emil Rüker. (53) Serial beginning June 10.
Autogenscheissung von kufernen Lokomotivfeuerbüchsen.* (Autogeneous Welding of Copper Locomotive Fireboxes.) Weese. (48) Sept. 3.
Wie kann man bei der Dampflokomotive Kohle sparen?* (How Can We Economize on Coal in the Steam Locomotive?) J. Rihosek. (48) Sept. 17.
Der Eisenbahnbau Tongern-Aachen.* (Tongern-Aachen Railway Construction.) E. Hünerwadel. (107) Serial beginning Oct. 1.

Railroads, Street.

The Urban Transportation Field Analyzed.* J. C. Thirwall. (17) Oct. 1.
The Lubrication of Rolling Stock.* L. W. W. Morrow. (17) Oct. 15.
Railway Tracks Removed from Streets of Dallas.* (13) Oct. 20.

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* Illustrated.

Railroads, Street—(Continued).

Timbered and Roof-Shield Tunneling in Deep Loose-Ground Subway Section.* W. C. Briggs. (13) Oct. 27.

Entkeimungsanlage der Wiener städtischen Strassenbahnen in Bahnhof Simmering. (Disinfecting Installations in the Simmering Station of the Vienna Municipal Street Railways.) (53) May 28.

Roads and Pavements.

Standard Concrete Highway Bridges and Culverts.* A. C. Irwin. (121) Vol. 17.

Equipment for Concrete Road Construction. F. M. Bakley. (121) Vol. 17.

Developments in Plant and Organization for Concrete Road Construction. C. R. Ege. (121) Vol. 17.

Some Considerations Governing Road Development in the Transvaal. A. D. Hohnwood. (114) Sept. 24.

The Michigan Boulevard Improvement. Hugh E. Young. (4) Oct.

Wilkinsburg, Pa., Modernizes 29-Year Old Brick Pavement. Charles F. Sperling. (60) Oct.

Bituminous Pavement Design—Aggregate Survey.* F. S. Besson. (60) Oct.

Handling Traffic During Highway Construction. Paul D. Sargent. (Paper read before New England Conference of Highway Commissioners and Motor Vehicle Registrars.) (86) Oct. 5.

Methods and Cost of Constructing Concrete Post-Wooden Rail Guard Fence.* C. L. McKesson. (From *Public Roads.*) (86) Oct. 5.

Comparison of Three Methods of Concrete Road Construction.* (From *Bulletin* of Assoc. Pennsylvania Highway Contractors.) (86) Oct. 5.

Refined Tar in Road Construction and Maintenance. Philip P. Sharples. (From paper read before Canadian Assoc.) (86) Oct. 5; (96) Oct. 13.

How the Oldest Town in the United States Repairs Its Pavements.* Engene Master. (86) Oct. 5.

Road Design and Location. E. W. James. (96) Oct. 6.

Illinois Highway Department Makes Road Tests.* Clifford Older and H. F. Clemmer. (120) Oct. 13.

Experiment on Desert Road with Asphaltic Pavement. (13) Oct. 13.

Thin Binder Course a Menace to Asphalt Pavement.* Roy M. Green. (13) Oct. 20.

Central Mixing for Concrete Roads. C. S. Hill. (13) Oct. 20.

Fundamental Principles in Handling Earthwork. D. H. Sauerbraun. (Paper read before Univ. of Pennsylvania.) (96) Oct. 20.

Strength Tests on Pre-Mixed Concrete on Detroit Street Railways.* W. R. Dunham, Jr. (13) Oct. 27.

Lastkraftwagenverkehr und Strassenerhaltung.* (Motor Truck Freight Traffic and Street Maintenance.) W. Voit. (53) Feb. 11.

Sanitation.

The Application of Colloid Chemistry to the Filter-Pressing of Sewage Sludge.* John Arthur Wilson and others. (59) Sept.

Inverted Siphons for Sewers Final Report of Committee. (109) Sept.

Detroit's Great Sewer Program.* M. Woolsey Campau. (117) Oct.

The Oxygen Consumed Test.* John Scacciaferro. (36) Oct.

Sewer Construction in Detroit, Michigan.* F. F. Griswold. (60) Oct.

Swimming Pool Construction.* Herbert L. Flint. (119) Oct.

Some Examples of Outdoor Swimming Pools.* William H. Punchard. (119) Oct.

Imhoff Tank Experiences in America.* Peter Gillespie. (96) Oct. 6.

Removal of Colloids from Sewage: Theory and Practice.* Waldo S. Coulter. (13) Oct. 6.

Minnesota Swamp Land Reclaimed for Farm Use.* Merlin H. Dappert. (13) Oct. 6.

Aeration Period of Sludge in the Activated-Sludge Process.* (13) Oct. 13.

Enlargement of the Sewage-Works of Baltimore.* C. Edward Keefer. (13) Oct. 20.

Sewer Grades and Sewage Disposal. Arthur J. Martin. (Paper read before Assoc. of Managers of Sewage Disposal Works.) (13) Oct. 20.

Ueber die fortlaufende Filtration der Schwimmbeckenwässer im Münchener Volksbad.* (On the Continuous Filtration of Water for the Swimming Pool in the Münich Public Bath.) H. Ilzhöfer. (7) Jan. 15.

Gewerbehygiene und Unfallverhütung. (Industrial Hygiene and Accident Prevention.) Georg Wolff. (7) Jan. 22.

Gesundheitstechnische Neuerungen.* (Novelties in Sanitary Technique.) H. Metzger. (7) Serial beginning Feb. 5.

Die Versalzung und Verhärtung des Elbwassers.* (The Water of the Elb Turning Salty and Hard.) W. P. Dunbar. (7) Serial beginning Feb. 19.

Versuche mit dem Dampf- und Vakuum- Formalin- Düsen- Desinfektionsapparat.* (Experiments with the Steam and Vacuum Formalin Jet Disinfecting Apparatus.) Hüne. (7) Feb. 26.

Die Kanalisations- und Abwasserreinigungsanlagen der Stadt Spandau.* (Drainage and Waste Water Purification Plants in Spandau.) Fischer. (7) Mar. 12.

Chlorgas- Sterilisation und Desinfektion von Wasser und Abwasser.* (Chlorine Gas Sterilization and Disinfection of Water and Sewage.) Leon Gartzweiler. (7) Mar. 26.

Zur Frage der Abwasserbeseitigung bei Siedlungen. (On the Question of the Removal of Waste Water in Settlements Formed on Account of the Shortage of Houses.) H. Stooff. (7) Apr. 9.

Die Chemischen Reinigungsverfahren bei der Wasserversorgung der Trupp im Felde.* (Chemical Processes of Water Purification for Troops in the Field.) A. Hellmann. (7) Apr. 30.

Structural.

Contract Pressures and Stresses.* E. G. Coker and others. (75) Vol. 1.

Moments and Stresses in Slabs.* H. M. Westergaard and W. A. Slater. (121) Vol. 17.

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* Illustrated.

Structural—(Continued).

Report of Committee on Far Rockaway Fire.* (121) Vol. 17.
Report of the Special Committee on the Application of Metal Forms to Reinforced-Concrete Construction. (121) Vol. 17.
Report of Committee on Concrete Houses. (121) Vol. 17.
Report of Committee on Treatment of Concrete Surfaces. (121) Vol. 17.
Report of Committee on Standard Units of Design. (121) Vol. 17.
Report of Committee on Nomenclature. (121) Vol. 17.
Developments of Concrete Building Units in England.* John T. Stewart. (121) Vol. 17.
Coloring Concrete. John W. Lowell. (121) Vol. 17.
Shrinkage of Portland Cement Mortars and Its Importance in Stucco Construction.* J. C. Pearson. (121) Vol. 17.
A Study of Column Test Data.* Franklin R. McMillan. (121) Vol. 17.
Test of a Flat-Slab Floor of the New Channon Building.* H. F. Gonnerman and F. E. Richart. (121) Vol. 17.
Lessons in Fire-Resistance from the Frankford Fire.* W. A. Hull. (121) Vol. 17.
Further Tests of Concrete Tanks for Oil Storage. George A. Smith. (121) Vol. 17.
Tolerance of Coarse Aggregate Passing the ¼-In. Sieve as Affecting Specifications for Gravel Aggregates.* William K. Hatt and R. B. Creppo. (121) Vol. 17.
Fire Resistance of Concrete Block and Brick. (121) Vol. 17.
Report of Committee on Cement Floor Finish.* (121) Vol. 17.
Standard Specifications for Concrete Floors. (121) Vol. 17.
Some Experiences with Thin Concrete Slabs.* John V. Shaefer. (121) Vol. 17.
Tests of a Concrete Mixer.* W. K. Hatt. (121) Vol. 17.
Placing Concrete Under Novel Conditions.* George Murgatroyd. (36) Oct.
Construction Accounting Under Uniform System.* (117) Oct.
Wetness *vs.* Fatness. L. H. Hart. (117) Oct.
Gypsum as a Building Material. Leo Griswold Hall. (19) Oct.
Quick Hardening Cement Developed by the French. Edwin C. Eckel. (13) Oct. 6.
Interpreting the Chemical Analysis of Portland Cement. J. C. Witt. (13) Oct. 20.
The Thermal Conductivity and Diffusivity of Concrete. (From *Bulletin* published by Univ. of Illinois.) (86) Oct. 26.
Cape May Hangar for Dirigible Built from Two Small Ones.* (13) Oct. 27.
Large Roofs Suspended by Cables to Avoid Columns.* (13) Oct. 27.
Tunnelling the Selkirks.* (46) Nov.
Recherche Expérimental sur la Déformation des Matériaux Pierreux par Flexion Composée.* (Experimental Research on the Deformation of Materials.) G. Magnel. (30) June.
La Résistance a l'Incendie des Différents Genres de Piliers et Colonnes.* (Fire Resistance of Different Types of Pillars and Columns.) P. Calfas. (33) Serial beginning Sept. 24.
Zur Berechnung statisch unbestimter Vollwandbinder mit Hilfe von Verschiebungsplänen.* (The Calculation of Static Undetermined Plain Trusses with the Help of Transposition Planes.) E. Kammer. (69) Mar. 9, 1920.
Ueber die Biegungsfestigkeit von [-Eisen.* (On the Flexure Strength of [-Iron.) F. Wansleben. (69) Apr. 9, 1920.
Verringerung des Sicherheitsgrades. Ein Weg zum sparsamen Bauen. (Reduction of the Factor of Safety. A Method to Economize on Construction work.) Franz Czech. (69) Apr. 9, 1920.
Die Durchbiegung einer exzentrisch durch eine Einzellast belasteten Kreisplatte.* (The Deflection of a Circular Plate Loaded Eccentrically by a Single Load.) Ernst Melan. (69) May 18, 1920.
Trapezförmige Fachwerkstützen mit Streben von gleicher Neigung.* (Trapezoidal Framework Supports with Braces at Equal Inclinations.) O. Kettner. (69) May 18, 1920.
Zur Frage der Rostsicherheit des Eisens im Beton.* (On the Question of the Prevention of Corrosion of Iron in Concrete.) Amos. (78) June 5, 1920.
Zur Berechnung von Mastenfundamenten.* (On the Calculation of Foundations for Masts.) W. L. Andrée. (69) June 15, 1920.
Die neuen ministeriellen Bestimmungen für Hochbauten in Preussen.* (The New Government Regulations for High Buildings in Prussia.) Alfred Gregor. (69) June 15, 1920.
Bauweise "Schnell.* ("Schnell" Methods of Construction.) (78) Serial beginning July 5, 1920.
Beitrag zur Berechnung auf Knickung beanspruchter Rahmengebilde.* (Contribution to the Calculation of the Buckling of Loaded Frame Structures.) Karl Ljungberg. (69) July 16, 1920.
Weitspannende Sägeformdächer (Fachwerk-Sheds.)* (Wide Span Saw-Tooth Roofs. (Framework Sheds).) Em. Haimovici. (69) Apr. 9, 1920.
Ueber das unverstümmelte Grundgesetz der Biegungstheorie und den Sinn der Eulerschen Knickgleichungen.* (On the Original Fundamental Law of the Theory of Flexure and the Sense of the Euler Equations for Buckling.) Ewald Rasch. (69) June 4, 1920.
Neuere Versuche mit tragerlosen Decken. (Recent Experiments with Girderless Ceilings.) Jar. J. Polivka. (78) June 5, 1920.
Die Inerschnittsermittlung rechteckiger. auf Doppelbiegung beanspruchter Balken. (Determination of the Cross-Section of Rectangular Loaded Beams Under Double Flexure.) Böhrig. (69) June 15, 1920.
Bestimmung der ungünstigsten Laststellung einer wandernden Laststreifengruppe bei Dreieckseinflusslinien.* (Determination of the Most Unfavorable Placing of the Load of a Moving Group of Loaded Bands on Triangular Influence Lines.) Leopold Herzka. (69) June 15, 1920.
Grundsätze und Richtlinien beim technischen Arbeiten.* (Fundamentals and Guiding Principles for Technical Work.) Alfred Gregor. (69) July 6, 1920.
Entwurf zu einem Leipziger Messturm mit 30 Stockwerken.* (Plan of a Tower 30 Stories High for the Leipzig Fair.) Em. Haimovici. (69) July 16, 1920.

* Illustrated.

Structural—(Continued).

Bemerkenswerte Bauausführungen mit Einschluss der Kleinwohnungsbauten.* (Noteworthy Types of Building Construction Including the Construction of Small Dwellings.) Heinrich Sielken. (78) Serial beginning Aug. 5, 1920.

Die Bemessung von Nietverbindungen bei Richtungswechsel der Beanspruchung.* (The Measuring of Rivet Connections on Changing the Direction of the Load.) (69) Aug. 24, 1920.

Beitrag zur Berechnung der Formänderung von Kragträgersystemen.* (Contribution to the Calculation of the Change in Form of Systems of Truss Beams.) Eduard Cecerle. (69) Sept. 3, 1920.

Spannungsermittlung bei Eisenbetontragteilen beliebigen Querschnitts mit schrägem Lastangriff.* (Transmission of Stresses in Ferro-Concrete Bearing Parts of Any Cross-Section with Oblique Application of Load.) G. Hartschen. (78) Sept. 4, 1920.

Entwürfe neuer Normblätter.* (Drafts of New Standards.) (78) Sept. 20, 1920.

Berechnung der Knickbelastung von Gitterwerkskonstruktionen.* (Calculation of the Breaking Load of Lattice Work Constructions.) Karl Ljungberg. (69) Sept. 24, 1920.

Neuere Kohlenlagerhäuser in Eisenbeton.* (New Coal Storage Houses of Reinforced Concrete.) G. Escher. (78) Oct. 4, 1920.

Berechnung des Vierendeel-Trägers mit Hilfe von mehrgliedrigen Elastizitätsgleichungen.* (Calculation of the Vierendeel Beam with the Help of the Elasticity Equations with a Number of Parts.) Kurt Lerche. (69) Nov. 19, 1920.

Normen für Beton und Eisenbeton. (Standards for Concrete and Reinforced Concrete.) (78) Nov. 4, 1920.

Einwirkung von Kohl auf Beton.* (Effect of Coal Upon Concrete.) (78) Nov. 4, 1920.

Das gelenkig gelagerte Doppelportal.* (The Double Portal on Articulated Bearings.) Kaufmann. (69) Nov. 5, 1920.

Die Zähigkeit des Materials als Grundlage für die Berechnung von Brücken, Hochbauten und ähnlichen Konstruktionen aus Flusseisen. (Toughness of Material as a Basis for the Calculation of Bridges, Building Constructions and Similar Constructions of Ingot Iron.) (69) Dec. 3, 1920.

Die Berechnung achsensymmetrisch gleichmässig belasteter Ringtragwerke.* (The Calculation of Annular Supporting Structures Uniformly Loaded Symmetrically to the Axes.) F. Wansleben. (69) Dec. 3, 1920.

Die Bauausstellung in London.* (The Building Exposition at London.) Wernekke. (78) Dec. 4, 1920.

Die Berechnung der Stockwerkrahmen mit beliebiger Felderanzahl.* (The Calculation of the Frame for a Floor with any Number of Bays.) Ernst Melan. (78) Dec. 4, 1920.

Beitrag zur Berechnung der schiefen Zugkräfte am Auflager eines frei aufgelagerten Eisenbetonbalkens auf zwei Stützen, der durch eine gleichmässig verteilte Last und eine wandernde Eingellast belastet wird.* (Contribution to the Calculation of the Oblique Tractive Force on the Rests of a Ferro-Concrete Beam Lying free on Two Supports, and Loaded by a Uniformly Distributed Load and by a Single Moving Load.) Georg Linke. (78) Dec. 4, 1920.

Die Biegungsbeanspruchung von Platten durch Eingelkräfte.* (Bending Loads of Plates by Single Forces.) A. Nádai. (107) Dec. 4, 1920.

Ueber die angenäherte Lösung von Stabilitätsproblemen im Raum mittels der elastichen Gelenkkette.* (On the Approximate Solution of Problems on Stability in Space by Means of the Elastic Articulated Chain.) Heinrich Hencky. (69) Dec. 21, 1920.

Aus der Konstruktionspraxis.* (Good Practice in Construction Work.) Rud. Kramer. (69) Jan.

Schubbewehrung von Eisenbetonbalken mit beweglicher Belastung.* (Protection Against Shock in Ferro-Concrete Beams with Moving Loads.) W. Hohmann. (78) Jan. 4.

Neuzeitliche Fabrikneubauten in den Vereinigten Staaten von Nordamerika.* (Modern Factory Construction in the United States of America.) Otto Schlich. (78) Serial beginning Jan. 4.

Schubspannung und Schubbewehrung nach den deutschen "Vorschriften" und preussischen "Musterbeispielen".* (Shear Tension and Avoiding Shear According to German Directions and Prussian Model Examples.) Birkenstock. (78) Jan. 4.

Ueber Winkelstützmauern.* (On Angular Supporting Walls.) A. Ostenfeld. (78) Serial beginning Jan. 4.

Die Druckfestigkeit von Voll- und Hohlsteinen. (The Resistance to Compression of Solid and Hollow Bricks.) (78) Jan. 4.

Grünfuttertürme aus Mauerwerk und Beton.* (Masonry and Concrete Silos.) K. Matthies. (80) Jan. 11.

Wolkenkratzer im neuen Deutschland?* (Skyscrapers in New Germany?) H. Gerves. (80) Jan. 20.

Eisenkonstruktion für ein Kammergebäude einer Schwafelsäurefabrik.* (Iron Construction for a Chamber Building of a Sulphuric Acid Plant.) Luitpold R. von Teng. (69) Feb.

Beitrag zur Berechnung des eingespannten Bogenträgers auf Grund der Elastizitätstheorie.* (Contribution to the Calculation of a Fixed Arched Girder Based on the Elasticity Theory.) Bela Enyedi. (69) Feb.

Entwurfsgrundlagen für zweistielige Bogenhallenbinder ohne Zugband.* (Basic Sketches for the Bent Roof Truss of a Hall, without Tie Rods, with Two Point Support.) Otto Fröhlich. (78) Feb. 4.

Eisenbetonbauten im Militärlager Bruck-Királyhida.* (Ferro-Concrete Construction at the Bruck-Kir Military Camp.) Awner Badian. (78) Serial beginning Feb. 4.

Die Bedeutung der Keramik für unsere heutige Baukunst.* (The Importance of Ceramics in Our Present Architecture.) D. H. Altmann. (80) Feb. 26.

Leipziger Messeturm.* (Tower for the Leipzig Fair.) Em. Haimovici. (80) Feb. 26.

* Illustrated.

Structural—(Continued).

Bemerkungen über die Wärmeleitzahl von Bau- und Isolierstoffen und die Wärmedurchlässigkeitszahl neuer Bauweisen. (Remarks on the Heat Conductivity Number of Construction and Insulation Materials and the Heat Losses in Modern Building Methods.) H. Chr. Nussbaum. (7) Feb. 26.

Einschiffige Rahmentragwerke in gemeinverständlicher Darstellung.* (Unit Frame Works in General Construction (Mathematical).) Em. Haimovici. (69) Mar.

Zementmauersteine: Was ist bei der Anlage einer Zementmauersteinfabrik zu beachten?* (Cement Brick: What Must be Observed on the Installation of a Cement Brick Factory?) Robert Paul. (80) Mar. 5.

Lastverteilung bei zweiseitig aufliegenden Eisenbetonplatten mit konzentrierter Belastung.* (Distribution of Load on Ferro-Concrete Slabs with Concentrated Loading.) W. Petry. (78) Mar. 7.

Die neuen Vorschriften für die Berechnung von trägerlosen Decken der Baubehörde von Neuyork.* (New Directions by the New York Building Authorities for the Construction of Girderless Ceilings.) Otto Schlich. (78) Mar. 7.

Versuche zur Ermittlung der Raumänderungen von Zement und Zementmörtel beim Abbinden.* (Experiments to Determine the Change in Volume of Cement and Cement-Mortar on Setting.) Otto Graf. (78) Serial beginning Mar. 7.

Die Zementfabrik in Torda.* (Cement Manufacture at Torda.) Hugó Székely and Ernst Havas. (78) Serial beginning Mar. 7.

Zeichnerische Untersuchung rechteckiger Steifrahmen.* (Diagrammatic Investigation of Rectangular Braced Box Frames.) J. Polívka. (78) Mar. 7.

Normen für Sand und Kies. (Standards for Sand and Gravel.) (80) Mar. 12.

Baustoffe. (Building Materials.) (80) Mar. 12.

Hochofenschlacke im Baugewerbe.* (Blast Furnace Slag in Building Construction.) C. R. Platzmann. (80) Mar. 24.

Altes in neuer Fassung.* (Old Things in New Forms (New Interpretation of Integrals for the Calculation of the Change in Form of Beam Systems Under Flexure).) E. Rothenburg. (69) Apr.

Einflusslinien ringförmiger Träger.* (Influence Lines of Annular Beams.) Friedrich Dusterbehn. (69) Apr.

Verstärkungsarbeiten.* (Reinforcing Constructions.) M. Schnyder. (78) Apr. 4.

Statische Untersuchung des zweistieligen Stockwerkrahmens mit beliebiger Form und Belastung.* (Static Investigation of a Frame for a Floor with any Shape and Load and Supported at Two Points.) Béla Enyedi. (78) Serial beginning Apr. 4.

Vereinfachte Auftragung von Momentenlinien: Die Momentenwurzellinien.* (Simplified Plotting of Moment Lines: the Roots of Moment Lines.) Oskar Herz. (53) Apr. 8.

Brandversuche mit Betonsäulen.* (Fire Tests with Concrete Columns.) Wernekke. (78) May 4.

Die Herstellung von Kalksandsteinen.* (Manufacture of Sand-Lime Stone.) Carl Naske. (48) June 4.

Bermerkungen zur Frage der Biegung. (Remarks on the Question of Flexure.) R. Maillart. (107) July 9.

Die Knicksicherheit gekreutzter Fachwerkstäbe.* (The Security Against Buckling of Crossed Framework Bars.) A. Freund. (69) Aug. 24, 1920.

Topographical.

Aerial Photographic Mapping Developed for Municipal and Other Engineering Services.* (13) Oct. 13.

Zeitersparnis beim Trassieren mit Hilfe des Gefällschnellmessers.* (Saving Time in Tracing with the Help of the Instrument for the Rapid Measuring of Slopes.) Günther Burstyn. (53) May 13.

Water Supply.

A Reservoir *versus* Additional Pumpage Capacity for Supplying Peak Demands.* L. A. Quayle. (59) Sept.

Municipal Water Rates.* E. E. Bankson and others. (59) Sept.

The Quality of Water at Different Points on a Water System.* Sheppard T. Powell. (59) Sept.

Overcoming Difficulties with Crustacea in Filter Beds. Helman Rosenthal. (59) Sept.

Rainfall in New England.* X. H. Goodnough. (28) Sept.

The Utilization of Tidal Power, with Special Reference to the Severn Estuary.* F. C. Lea. (11) Sept. 16.

Notes on Water-Power Development.* A. H. Gibson. (Paper read before British Assoc.) (11) Sept. 16.

Iron Bacteria in Relation to the Incrustation of Pipes. David Ellis. (Paper read before British Assoc.) (11) Sept. 23.

Handling Breaks in Irrigation Canal Embankments.* R. M. Adams. (13) Oct. 6.

Testing and Calculating Aluminum Sulphate Solutions.* Charles H. Capen. (13) Oct. 6.

The Herlandsfossen Hydro-Electric Plant.* (11) Serial beginning Oct. 7.

The Relation of Run-Off to Rainfall.* (11) Oct. 7.

Recent Water-Turbine Developments.* W. H. White. (96) Oct. 13.

Intake for Oshawa Water Supply.* Robert W. Angus. (96) Oct. 20.

Remodeling Plant to Increase Rating.* Phifer Smith. (27) Oct. 22.

Tables for Designing Non-Pressure Water and Sewer Tunnels.* Julian Hinds. (13) Oct. 27.

Proportioning and Making Concrete on Barrett Dam.* H. N. Savage. (13) Oct. 27.

Underground Water Storage on the Santa Ana Cone.* Hyde Forbes. (13) Oct. 27.

Making the Flood Dam Itself.* J. F. Springer. (46) Nov.

Ein Wasserbehälter in Eisenbeton.* (A Reinforced Concrete Water Tank.) Ernst Havas. (78) Nov. 4, 1920.

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* Illustrated.

Water Supply—(Continued).

Die Mittel zur Verhinderung der Grundwassererschöpfung. (The Method for Preventing the Exhaustion of Ground Water.) G. Schonke. (7) Jan. 1.
Betonrohre aus Zement und Kalk. (Concrete Pipes from Cement and Lime.) H. Jolig. (80) Jan. 6.
Die Anwendung von Eisenbetondruckrohren bei Wasserkraftanlagen.* (Use of Reinforced Concrete Pressure Pipes in Hydraulic Power Plants.) Leo Nagel. (53) Jan. 14.
Die Wasserkräfte von Nordtirol. (Water Powers of Northern Tyrol.) K. Innerebner. (53) Serial beginning Jan. 14.
Ueber den Ausbau der Wasserkräfte in Bayern.* (On the Development of Water Resources in Bavaria.) Philipp Forchheimer. (53) Jan. 14.
Gezeitenkraftwerk in England.* (Tide-Water Power Plant in England.) (48) Jan. 15.
Einrichtung zum registrierenden Messen von Wasserstand und Wassermenge in geregelten Gerinnen.* (Arrangement for Recording Water Level and the Amount of Water in Regulated Channels.) L. Schmidt. (53) Jan. 28.
Genaue Berechnung der Formänderung eines kreiszylindrischen Wasserbehälters mit Parabelquerschnitt durch den Wasserdruck.* (Exact Calculation of the Change in Shape of a Circular Cylindrical Water Container with a Parabolic Cross-Section Through Water Pressure.) Alexander Fischer. (53) Feb. 25.
Wirtschaftliche Bedeutung des Wirkungsgrades der Wasserturbinen für Entscheidungen beim Neubau und Umbau.* (Economic Importance of the Efficiency in Deciding Whether to Build New, or Reconstruct Old Water Turbines.) Leiner. (48) Feb. 26.
Wirtschaftliche Betriebsweise wagrecht durchflossener Klärbecken.* (Economic Methods of Operating Horizontal Continuous Clarifying Basins.) Friedrich Schrank. (7) Mar. 19.
Ueber die Spiegelbewegung in Wasserschlossern bei Anordnung eines Zwischenwasserschlosses.* (On the Variation of Level in End Reservoirs if There are Intermediate Reservoirs.) Armin Schoklitsch. (53) June 24.
Druckrohre aus Eisenbeton bei Wasserkraftanlagen.* (Pressure Pipes of Reinforced Concrete in Hydraulic Power Plants.) Leo Nagel. (78) Sept. 4.

Waterways.

Vaal River Scheme, with Special Reference to The Vaal River Barrage. W. Ingham and J. C. Hawkins. (114) Sept. 24.
A New Type of Bank Protection.* (87) Oct.
Improvements on Lake Washington Ship Canal.* W. A. Scott. (117) Oct.
City Surveys of Rivers and Harbor at Milwaukee.* (13) Oct. 6.
Fighting the Water Hyacinth.* Thomas Ewing Dabney. (46) Oct. 8.
The Hudson River Caissons.* Robert G. Skerrett. (46) Oct. 8.
Progress on Pit River Project in California.* (13) Oct. 13.
Waterfront Bulkhead Construction at Two Lake Cities.* (13) Oct. 13.
The New Marine Salvage System.* (46) Nov.
Les Travaux d'Asséchement due Zuiderzée (Holland).* (The Drainage of the Zuider Zee (Holland).) Alfred Bijls. (33) Sept. 24.
Les Ascenseurs pour Bateaux du Canal du Centre.* (Canal-Boat Elevator on the Centre Canal.) L. Van Wetter. (30) June.
Der Ausbau des Rheins zwischen Basel und Strassburg.* (Development of the Water Resources between Basel and Strassburg.) E. Mattern. (48) Jan. 8.
Wien als Hafenstadt. (Vienna as a Port.) (53) Feb. 4.
Schiffshebewerk.* (Ship-Hoisting Device.) (53) Aug. 5.
Ueber Versuche mit Verdichtungsdüsen (Diffusoren).* (On Experiments with Compression Nozzles (Diffusors).) August Riffart. (48) Aug. 27.
Die Wasserstrassenverbindung Rheinlands und Westfalens mit den Küsenstädten.* (Connecting the Rheinland and Westphalia by Water with the Coast Cities.) M. Hahn. (50) Sept. 22.

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* Illustrated.